

The role of the BBC in creative clusters

Analysing the BBC's wider impact
on the UK economy

November 2022



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Foreword

We are delighted to present this report, quantifying the BBC's role in the development and growth of Creative Clusters across the UK, and the onward benefits of creative clusters to the UK economy.

The BBC is an important British institution; having been the UK's national broadcaster for over a century, it is also the world's oldest national broadcaster. An organisation of such size and influence plays an important role in the UK economy, particularly in the creative sector. Creative workers, and firms, have a reason to locate in close proximity to where the BBC has a significant presence; this process is known as 'creative clustering'. This report serves as the first robust quantification of this phenomenon, using large national microdata and econometric methods to establish the BBC's role in the formation and growth of creative clusters.

This report is timely, in light of the BBC's "Across the UK" plans to expand its presence in regions outside of London, and the UK Government's focus on Leveling Up. The 2021 Leveling Up white paper sets out evidence that large, innovative, 'anchor institutions' such as universities are crucial in developing pools of talent in a local area, increasing productivity and catalysing growth.

The research presented in this report demonstrates that the BBC is such an anchor institution, and plays a key role in the development of the wider creative sector in the places in which it has a major presence.

We also assess the spillover benefits of creative cluster growth. We find that creative clustering creates jobs, and that these jobs are more productive, better paid, and have better working conditions than equivalent jobs in other industries. Taken together with the BBC's role in the promotion of creative clustering, this demonstrates the BBC has an important role to play in Leveling Up.

The approach we took to this work was particularly innovative, linking BBC HR and procurement data to external sources, including Companies House and ONS microdata. The econometric approach was grounded in top academic research, ensuring the robustness of the results presented. I hope you enjoy reading this report as much as we have enjoyed compiling it.



Nick Forrest
UK Economics
Consulting Leader

A handwritten signature in black ink that reads "Nick Forrest".

Executive summary



The HM Government Levelling Up White Paper sets out economic clustering as one of the key strategies to promote regional growth and narrow regional inequalities. It cites evidence that the geographical presence of anchor organisations such as universities and higher education institutions is important in catalysing economic clusters, whereby high-skill, high-value-add, companies co-locate to take advantage of local labour markets, supply chains and, above all, of proximity to each other.

This report is the first to use empirical techniques to assess the role of the BBC as an anchor institution in the development of clusters of creative industries across the whole of the UK, and the wider ‘spill-over’ benefits of these creative clusters to the local community. While strong anecdotal and qualitative evidence already exists to demonstrate that the BBC is an important catalyst, this study finds quantitative evidence of how the presence of the BBC in a community drives the development of creative clusters, and how the size of the BBC presence affects the size of the cluster. The study also finds strong positive evidence of local labour market impacts, through the creation of skilled, more productive, higher-paid, and fairer work.

The empirical findings of the study are based on a two-stage spatial econometric model that first estimates the impact of BBC’s footprint (using historical data on BBC’s employment and spending across UK regions) on the growth of creative clusters, and subsequently estimates how such cluster growth impacts local economic outcomes (combining BBC data with individual-level ONS microdata). The study finds the following:

The BBC’s activities are well-spread regionally, helping to share the benefits of creative industries growth across the UK. BBC spending occurs in 225 of 228 local communities across the UK’s nations and regions. Salford is a prime example of large BBC influence but there are other local economies like Bristol or Cardiff where BBC’s activity is significant. Without anchor institutions like the BBC pushing investment into regions, creative activity would likely remain unequally concentrated in London and the South East and the benefits of the sector’s future growth would fail to be shared equally.

Creative clustering is a driver of growth and post-COVID recovery for the UK economy. The UK creative sector grew by 44% over the period 2010-2019, more than double the growth of 17.9% across the UK economy over the same period. In 2019, creative industries contributed approximately £115.9 billion of Gross Value Added (GVA), equivalent to 5.9% of total UK GVA (the Film, TV, video, radio and music subsector contributed heavily to this, with GVA of £21.7 billion in 2019)¹.

To put this figure in context, financial services contributed £124.9bn to UK GVA in the same year². The growth trajectory in the creative sector is set to continue post-COVID: by some estimates, the GVA of creative industries in the UK will more than double between 2020 and 2030, reaching a GVA of approximately £300 billion³.

The BBC promotes an enduring increase in the growth of creative clusters, both in industries that relate to broadcasting, and the wider creative sector.

We find that a 1% increase in the BBC’s local footprint accelerates the rate of cluster growth over time by 6.9% in industries that are most relevant to broadcasting, or, to put this another way, a 15% increase in the BBC’s local footprint approximately doubles the rate of cluster growth over time. This means that as the scale of the BBC’s presence increases within a local economy, firms in related creative sub-sectors have an increased tendency to locate close by. Perhaps more powerfully, we also find similar results for the creative sector as a whole: a 1% increase in the BBC’s local footprint results in a 4.5% increase in the rate of cluster growth in the creative sector as a whole, indicating that BBC activity has a positive spill-over to firms in the wider creative sector.

It is the scale of the BBC’s local presence that matters to cluster growth. This suggests that it is the BBC’s sustained investment in the local media ecosystem through building talent pools and convening and partnering across the sector locally that encourages crowding in of other businesses around the BBC’s local hubs. Local procurement and commissioning spend naturally follow as a secondary boost to the local creative economy.



² Hutton, G and Shalchi, A, Financial Services: contribution to the UK economy, House of Commons Library, 2021, <https://researchbriefings.files.parliament.uk/documents/SN06193/SN06193.pdf>

³ CFSD, Creative Industries Foresight 2030, University for the Creative Arts, https://cfsd.org.uk/wp-content/uploads/2020/04/UCA_CI_Foresight2030_RevA.pdf

¹ DCMS: <https://www.gov.uk/government/statistics/dcms-economic-estimates-2019-gross-value-added#full-publication-update-history>

The BBC acts as a critical anchor institution in the development of creative clustering across the whole of the UK, and as such, the BBC is an important enabler for the promotion of regional levelling up. For example, a 5% increase in the BBC's footprint in Greater Manchester would be expected to translate into approximately 120 additional creative firms within a year, and a similar increase in BBC's Birmingham activity would translate into 60 additional creative firms over the same period⁴.

Creative clustering enabled by BBC investment creates jobs and opportunities in the local area. We find strong evidence that creative clustering increases local creative sector employment. A 1% increase in the size of a creative cluster increases the share of local workers employed in the creative sector by 1.7 percentage points, and the overall local employment rate by 0.5 percentage points⁵. In Bristol that translates to approximately 457 jobs, and 418 jobs in Cardiff, in net terms.

Jobs in the creative sector are more productive allowing them to be higher paid. Creative businesses are, on average, more productive than firms in other sectors and such trends seems to be amplifying⁶: employment in the creative sector has increased by 12% between 2010 and 2019; since GVA has grown much more in the same period (44%), this means that creative workers have become more productive over time.

An outcome of this is that creative workers can earn more than their counterparts in other sectors: an employee who finds work in the creative sector can earn a wage premium of between 7.3% and 9.4% over a worker with a similar demographic and skill profile in another industry. This equates to an approximate £2,600 per year increase for the average earner⁷.

Creative clustering enabled by BBC's activities improves working conditions for employees.

Employees who work in creative industries work between 9% and 11% less unpaid overtime, and, as a result, an increase in creative clustering is associated with a decrease in the overall level of unpaid overtime in the local economy. This suggests that jobs in the creative industries are not just better paid, but are subject to better overall working conditions.

This study therefore concludes that the BBC acts as an anchor institution in local economies across the UK, contributing significantly to the development of creative clusters, and to the productivity and living standards in local communities. Continued funding of the BBC's out of London activity, as well as actions by the BBC such as its Across the UK plans, should therefore be considered as effective instruments for levelling up.



⁴ Using DCMS definition and extrapolating from BBC employment data in Salford
⁵ We define creative sector employment as the number of workers employed in the creative sector, divided by the labour force in the local area. For example, an increase from 2% to 3% would represent a 1 percentage point increase in creative sector employment

⁶ The average labour productivity in the creative industries was roughly £69,000 per FTE worker between 2015 and 2018. This includes the sound recording and music publishing subsector, the productivity was £159,099, almost three times greater than the UK economy (£58,833). Source: Cebr, Contribution of the arts and culture industry to the UK economy, 2020.

⁷ Using ONS average.



Creative cluster development and the BBC

The BBC is at the forefront of investment and innovation in the creative sector, and the evidence presented in this study suggests that without anchor institutions like the BBC pushing activity into the regions, the creative economy would likely remain unequally concentrated in London – particularly for the audiovisual sector, in which 51.3% of activity is based in London⁸.

The BBC can act to redress this balance since it is critical to the UK's Film, TV, video, radio and music subsector; out of sector GVA of £21.7 billion in 2019, the BBC contributed 14%⁹ and of the 224,000 workers in this subsector, BBC employees accounted for 8.5%.

The findings of the empirical analysis suggest that larger BBC investments and transformation programmes with enduring presence are more likely to boost the growth of clusters in local economies. Shifts in BBC's spend and activity have been mirrored by cluster development out of London. This trend is likely to continue given that the BBC is committed to continuing investing in regions outside of London; the BBC has committed to spending at least an additional £700 million outside of London by 2027/28¹⁰, which our findings suggest will significantly support continuing regional cluster development.

Creative clusters are already becoming more geographically diffuse across the UK. In all of Belfast, Birmingham, Bristol, Cardiff, Glasgow and Manchester, at least 8% of companies are creative and over 2.5% of employees work in creative industries. Bristol in particular, where BBC Studios has been an anchor presence for many years, saw employment in creative industries grow by 74% over 2015-2020. More and more locations seem to be creating the critical mass (i.e. in terms of skills and investments) to grow successful creative clusters.

Furthermore, areas of strong creative cluster growth such as Bristol, Glasgow and Cardiff also feature a heavy BBC presence, both in terms of employment and supply chain spending. Given the research presented in this report finds a strong relationship between BBC's economic footprint in a local economy and creative clustering, we would expect this trend to be accelerated as the BBC's 'Across the UK' plan is enacted. Using the econometric findings of this report, we calculate that the increased creative clustering generated by these plans will result in approximately 4,750 new creative firms and 45,000 additional jobs outside London and the South East by 2027/28.

⁸ DCMS

⁹ Estimates from DCMS suggest that the contribution of the BBC to these industries could be as high as 22 percent - depending on the definition of the sub-sector: <https://www.gov.uk/government/statistics/dcms-economic-estimates-2019-gross-value-added#full-publication-update-history>

¹⁰ The BBC Across the UK: <http://downloads.bbc.co.uk/aboutthebbc/reports/reports/the-bbc-across-the-uk.pdf>

Implications for delivery of BBC's regional investment

The findings of the study give indications about how the BBC's future local activity can continue to have a positive impact on creative cluster development:

1 Pursue transformational initiatives:

Our findings suggest that the BBC should pursue large targeted investments in strategic locations that will create maximum impact. This is supported by the BBC's ability to enact transformational change through its investment and the subsequent development of creative clusters. A prime example is the creation of Media City in Salford, which has had a transformative impact on the local community by creating new opportunities that were not available before. While BBC activity does positively benefit smaller creative centres, this may not be so impactful in relation to cluster development if it is seen as a small commitment, particularly if not enduring. This means the BBC needs to be selective in the creative clusters it wishes to develop around the UK.

2 Collaborate with diverse stakeholders:

Though not quantified in this study, qualitative evidence suggests that the BBC convenes participants from across the creative sector and beyond to deliver maximum economic and social impact through partnerships, research and knowledge sharing and other business practices. For instance, BBC R&D works on large-scale research projects in partnership with multiple academic, commercial and local government partners, securing research funding and innovating across several areas – from connectivity and 5G use in rural areas to understanding digital citizenship. The BBC will be able to enhance its local economic impact and role in cluster development through utilising both its convening power (e.g. programme commissioning) alongside its locational spread of its own activities.

3 Invest in local talent:

Since the BBC works with local businesses, joint initiatives can build the local talent pool that will allow local creative clusters to continue growing. One example of the indirect impacts of BBC's activities is the BBC Academy's new Apprentice Hub, which arranges placements for aspiring creatives with local businesses – in areas as diverse as broadcast production, content creation, and digital marketing.

4 Keep social value in mind:

The BBC will maximise impact by combining activities and investments for cluster development with social programmes. Though wider social impacts are not quantified in this study, there are documented examples that suggest that social inclusion could also improve via the proliferation of non-profit enterprises, cultural institutions, arts values and local entertainment establishments. In addition to helping develop skills and jobs in an inclusive way, the BBC also supports content creation and production that suit local populations and can be a driving force of social cohesion.

Introduction: purpose of the research



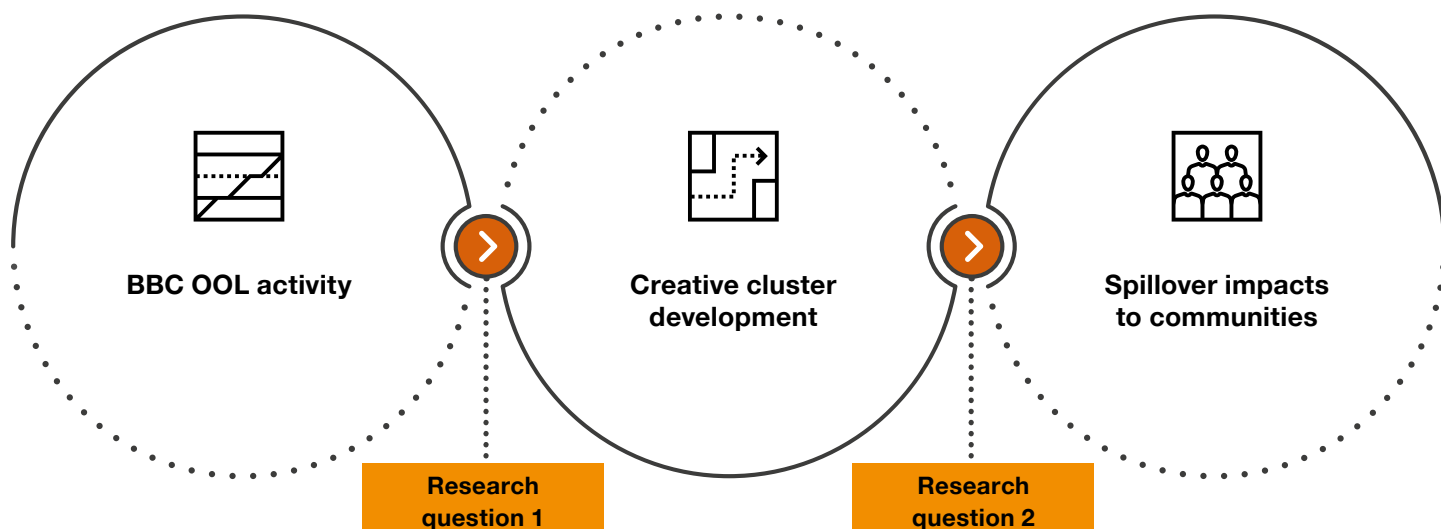
The UK's creative industries are wide-ranging and are a cornerstone not only of its culture but increasingly of its economy, being an important source of jobs. Since the formation of the Department for Media Culture and Sport in 1997 the Government has increasingly recognised the sector's economic and socio-cultural significance. The strategic interest in the creative industries has intensified in the last decade since it shows signs of bringing prosperity across diverse regions and local economies, a key goal of the 'levelling up' ambitions in the UK.

The BBC is at the forefront of investment and innovation in the creative sector, and its large investments outside of London, and the subsequent growth of the creative sector in these areas, suggest that the BBC is an important catalyst for localised growth in the creative sector – it is an anchor institution that attracts talented people and investments into the local economies in which it operates. This means that the BBC can become a key driver of inclusive prosperity, creating work opportunities for diverse populations, and of regional levelling up. Investment in the BBC is therefore an important policy instrument in the promotion of levelling up.

The purpose of this study is to generate an evidence base on the impact the BBC has on the growth of creative industries across the UK. Previous research indicates that creative firms tend to flourish in areas where other creative businesses also concentrate, thus creating 'clusters'. The empirical research used to develop the evidence in this study is first of its kind, as (a) it is the first to quantify the effect of BBC's activities on creative cluster formation and growth, and (b) it is the first to quantify the spill-over benefits of these clusters.

To be able to contribute to regional prosperity and convergence, such clusters need to show wide economic and social impacts in the local communities where they develop – including better employment opportunities for people and a better business environment for local enterprises. Therefore, the study is underpinned by two main research questions:

- **Research question one:** What is the impact of (local, out-of London (OOL)) BBC activity on the growth of creative clusters?
- **Research question two:** What is the impact of creative clusters on the wider economy and spill-over effects to society?



An econometric approach is used to produce joint quantitative evidence for the two research questions (1 and 2 in the diagram above), providing a holistic evidence base for how the BBC contributes to the UK economy through cluster formation.

The remainder of this report is structured as follows: Section 1 provides an overview of creative clustering across the UK; Section 2 presents the evidence underpinning the BBC's influence on cluster formation; Section 3 presents evidence on the spill-over impacts of creative clusters to local communities; Section 4 concludes, with a brief discussion on implications for the UK economy, including levelling-up, and for BBC decisions on directing its regional activities.

A collage of images. The top left shows a person's hands. The top right shows a control panel with a glowing orange light. The middle right shows a computer monitor displaying a technical interface. The bottom half shows a hand operating a machine with a black wristwatch.

1

Creative clusters in the UK

Highlights:

- Creative industries contributed approximately 5.9% to total UK GVA in 2019 and the BBC is a key investor in the sector.
- The sector has undergone unprecedented growth of 44% over the last decade (2010–2019) vs. 17.8% for the entire UK economy.
- Clustering has intensified over time, including in new regions where creative industries were still small until recently.
- There are a variety of creative cluster ‘specialisations’ spread across the UK.

1.1 The Economic benefits of clusters

Industrial clusters have existed since the early days of industrialisation. Clusters develop because firms in the same industry derive some benefit from locating in proximity to each other¹¹. These benefits vary from cluster to cluster, but key drivers of clustering include proximity to clients, proximity to suppliers, skilled labour pool, critical mass of firms in the sector and proximity to social networks¹². Previous research suggests that benefits can occur at the level of enterprises, industries and metropolitan areas¹³.

Clusters offer a plethora of other benefits, including lower search costs for talent and employees, efficient means of obtaining integral inputs, a reduction in the need for vertical integration, access to specialised information, and other organisation operational efficiencies. Due to the concentration of specialised firms within the area, clusters often carry with them a strong presence and socially pervasive name which encourages stakeholders to look towards these areas.

Additionally, clusters allow for complementarities to gather, a great example being Silicon Valley which highlights the potential these regions hold. The number of jobs are higher, the need for production inputs are higher, and there is a tendency for consumers to gravitate towards these areas, making clusters hubs of opportunities.

Definition – Economic clusters

‘The term cluster is used to describe the geographic concentration of interconnected companies and institutions. Clusters are ecosystems in which people meet and exchange ideas, goods and services as part of common supply chains. By locating near one another, firms benefit from the area’s pool of expertise, finance and skilled workers, its access to component suppliers and its channels for spreading information and innovation.’ – HM Government Levelling Up White Paper, 2022.

Combined with this, as the cluster grows, government focus will shift towards these areas and governments will look to introduce public goods and institutions nearby in response to the public’s growing demand for the cluster. Moreover, the local rivalry makes it a hotspot for competition, driving increased growth and efficiency, and combatting many worries regarding collusion and monopolistic behaviour¹⁴.

The strength of local clusters, and the potential vitality and plurality of innovation that clustering delivers has been linked to regional economic performance¹⁵. Evidence in the UK and in other developed countries suggest that industries operating in a strong cluster environment perform better, leading to competitive advantage and growth. It is for this reason that the 2022 Levelling Up White Paper particularly focuses on the importance of supporting economic clusters throughout the UK.

¹¹ Sanjoy Chakravorty, Clusters and Regional Development, Oxford Research Encyclopedias: <https://oxfordre.com/internationalstudies/view/10.1093/acrefore/9780190846626.001.0001/acrefore-9780190846626-e-124>

¹² PwC analysis

¹³ Martin, R et al, Creativity, Clusters and the Competitive Advantage of Cities, Competitiveness Review An International Business Journal incorporating Journal of Global Competitiveness, 2015. The study finds positive correlations to economic output per capita, wages and innovation (in the range of 0.4 to 0.6).

¹⁴ Michael Porter, Clusters and the new economics of competition, Harvard Business Review, 1998. Access: <https://hbr.org/1998/11/clusters-and-the-new-economics-of-competition#:~:text=Because%20a%20cluster%20signals%20opportunity,of%20obtaining%20other%20important%20inputs>

¹⁵ The influential work on “clusters” led by Michael Porter since the 1990s has become the main tool for framing discussions around the drivers of cluster development. In a recent study, Delgado, Porter and Stern developed a model to investigate the impact of cluster composition on the performance of regions in the USA. They find strong evidence that industries operating in a strong cluster environment perform better. See Mercedes Delgado, Michael E. Porter, Scott Stern, Clusters, convergence, and economic performance, Research Policy, Volume 43, Issue 10, 2014, <https://media.nesta.org.uk/documents/creative-innovation.pdf>

Given the potential benefits of clustering for regional development, this is a theme that has attracted policy discussions in several industries. Although there is surprisingly sparse specific reference to creative clustering in the White Paper, the creative industries would appear to be a logical target for the promotion of clustering, because (a) there has been strong growth in UK creative sector over the past decade, (b) the industry relies heavily on human capital such as knowledge and creativity, so developing localised pools of labour is likely to improve efficiency and bolster growth, and (c) innovations from the creative sector have potential to diffuse to other sectors of the economy and beyond the geographical boundaries of creative clusters¹⁶.

The term 'creative industries' covers a range of complementary economic activities. They benefit from the flow of ideas enabled by closeness to other peers and collaborators, and it is this complementary that academic research suggests makes the creative industries a particularly good candidate for clustering.

There is emerging evidence that suggests creative clusters can increase productivity, employment and prosperity in local economies by facilitating knowledge spill-overs, dense buyer-supplier networks and access to a specialised labour pool¹⁷. There are also examples of co-location between creative sectors and other innovative industries, including knowledge-intensive business services but also high-tech manufacturing¹⁸.

1.2 Creative clustering across the UK

The strategic growth of creative industries

The creative industries have quickly become a key driver of competitive advantage for the UK. Though definitions vary, with some considering a broader or narrower set of industries within it, in general creative industries are those that have their origin in individual creativity, skill and talent. They have a potential for wealth and job creation through the generation and exploitation of intellectual property, as well as a broader range of benefits as set out in Section 1.1¹⁹.

¹⁶ Creative products may be direct inputs into the innovation processes of purchasing firms (good examples may be software or advertising). Furthermore, supply chain linkages to the creative industries could provide a mechanism which facilitates the transfer of ideas and knowledge between creative businesses and firms in other industries. See the econometric evidence for the UK presented by Bakhshi, H., McVittie, E. and Simmie, J. (2008) 'Creating Innovation: Do the creative industries support innovation in the wider economy?' NESTA research report. <https://www.sciencedirect.com/science/article/abs/pii/S0048733314001048>

¹⁷ By sharing common technologies, knowledge, inputs, outputs, and cluster-specific institutions, industries within a cluster may benefit from numerous complementarities. See Mercedes Delgado, Michael E. Porter, Scott Stern, Clusters, convergence, and economic performance, Research Policy, Volume 43, Issue 10, 2014

¹⁸ This type of colocation can occur because complementarities between these sectors are supported by value chain linkages, shared infrastructures, knowledge spill-overs, creation of 'urban buzz' that attracts skilled workers and encourages collaboration. Evidence has been produced, for instance, for a 2 year collaboration with Birmingham & Cardiff universities examining the role that creative clusters play in local innovation systems (see Chapain et al, "Creative Clusters and Innovation: putting creativity on the map", NESTA, November 2010).

¹⁹ GOV.UK, Creative Industries Mapping Documents, 2001, <https://www.gov.uk/government/publications/creative-industries-mapping-documents-2001>



Definition – Creative industries

The analysis presented in this report uses two definitions of creative industries. The Department for Culture, Media, and Sport (DCMS) broadly defines the creative sector in terms of Standard Industry Classification (SIC) codes. This definition includes sub-sectors that are directly related to BBC activity, e.g. film, TV, radio and photography, and also sub-sectors in the wider creative sector that are less so, e.g. architecture.

2016 research by Nesta provides a more refined definition of industries within the creative sector that tend to cluster alongside broadcast media. Using a data-driven statistical approach, it is found that Publishing, Film, Radio and TV, and Music and Performing Arts, have a high propensity to co-locate. We additionally use this finding in our modelling to capture sub-sector clustering that is most relevant to the BBC²⁰.

This section uses the DCMS definition of creative clusters throughout, however for robustness, the analysis presented in Sections 2 and 3 uses both definitions.

Consisting of wide-ranging sub-sectors, from content industries such as film and video games, to service industries like advertising and design, the creative sector grew by approximately 44% between 2010 and 2019²¹. This level of growth was well ahead of the 17.9% growth of the UK economy as a whole, identifying the creative industries as an important driver for economic growth in the UK. Employment growth in the creative industries was 7% between 2015-2020, as compared to 2% in the rest of the UK economy, and the creative industries accounted for approximately 4% of all employment in the UK in 2019.

In 2019, creative industries contributed approximately £115.9 billion of Gross Value Added (GVA), equivalent to 5.9% of total UK GVA (the Film, TV, video, radio and music subsector, of which the BBC is a part, contributed heavily to this, with its 2019 GVA of £21.7 billion)²². To put this figure in context, financial services contributed £124.9bn to UK GVA in the same year²³. In 2019 creative industry exports were valued at £37.9bn²⁴ and the size of the UK's creative sector outstrips that of Germany and France²⁵.

Since its beginnings 100 years ago the BBC has been at the heart of the audiovisual sector and wider creative industries. The BBC contributed £4.9bn to the UK economy in 2019 and accounts for 14%²⁶ of the UK's Film, TV, video, radio and music subsector. Of the 224,000 workers in this subsector, BBC employees accounted for (8.5%). Additionally BBC Studios increasingly supports inward investment and exports of creative industries – the BBC estimates that by 2030, powered by additional borrowing powers granted to it by the government, BBC Studios will generate £7.5bn additional inward investment in the UK's creative economy.

The growth trajectory of the creative industries is set to continue post-COVID: by some estimates, the GVA of creative industries in the UK will more than double between 2020 and 2030, reaching a GVA of approximately £300 billion. This growth would result in approximately 350,000 additional creative firms and the growth of CreaTech, which could account for 40% of employment in creative industries by the end of the decade²⁷. Extrapolating from pre-covid trends, it is expected the creative sector will employ approximately 4.3 million jobs by 2030, increasing the creative economy's share of employment to 12%²⁸.

²⁰ Mateos-Garcia, J and Bakhski, H, The Geography of Creativity in the UK, NESTA, 2016

²¹ Department of Digital, Culture, Media and Sport

²² DCMS: <https://www.gov.uk/government/statistics/dcms-economic-estimates-2019-gross-value-added#full-publication-update-history>

²³ Hutton, G and Shalchi, A, Financial Services: contribution to the UK economy, House of Commons Library, 2021, <https://researchbriefings.files.parliament.uk/documents/SN06193/SN06193.pdf>

²⁴ DCMS <https://www.gov.uk/government/statistics/dcms-sectors-economic-estimates-2019-trade-in-services/dcms-sectors-economic-estimates-2019-trade-in-services#exports-of-services>

²⁵ Enders Analysis, The UK's ongoing status as a cultural powerhouse, May 2022, https://mcusercontent.com/e582e02c78012221c8698a563/files/76523897-cedd-b651-53f2-3c954b9c9077/The_UK_s_ongoing_status_as_a_cultural_powerhouse_2022_050_01.pdf

²⁶ Estimates from DCMS suggest that the contribution of the BBC to these industries could be as high as 22 percent – depending on the definition of the sub-sector, <https://www.gov.uk/government/statistics/dcms-economic-estimates-2019-gross-value-added#full-publication-update-history>

²⁷ CFSD, Creative Industries Foresight 2030., University for the Creative Arts, https://cfsd.org.uk/wp-content/uploads/2020/04/UCA_CI_Foresight2030_RevA.pdf

²⁸ See <https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/technology-media-telecommunications/deloitte-uk-future-creative-economy-report-final.pdf>

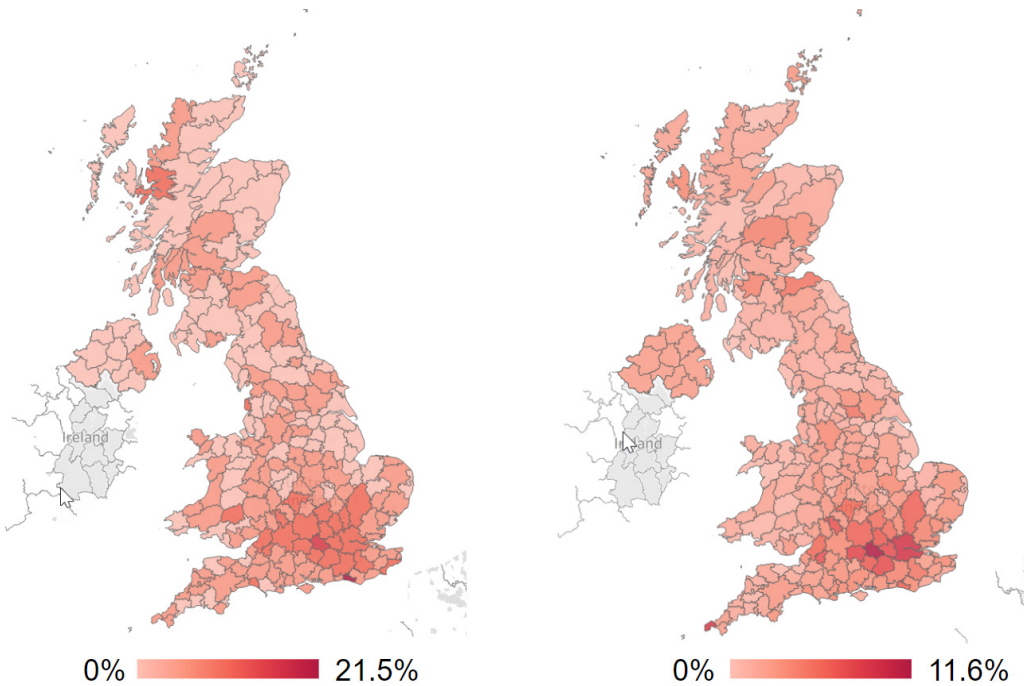
Regional distribution of clusters

A dense concentration of creative firms within a local economy can be referred to as a creative cluster. The UK boasts many creative hotspots or clusters and their formation is central to the success of the creative industries' contribution to the UK economy. A full depiction of creative clustering in the UK is illustrated in Figure 1 below using two metrics.

- The first heatmap (left) shows the average proportion of companies whose SIC codes are classified as creative in each Travel to Work Area (TTWA) between 2013 and 2021. The majority of UK creative activity is skewed towards London and the South-East, with Brighton leading the way with approximately 21% of its companies in the creative sector over the period 2013-2020.

- The second heatmap (right) shows the proportion of workers whose industry SIC codes are classified as creative by TTWA in 2020. Approximately 4% of the UK workforce was employed in the creative industries in 2020²⁹. This figure 1 varies by TTWA from 0.2% for Girvan to 11.6% for Reading.

Figure 1 – Creative clustering across UK regions – in Travel to Work Areas³⁰ (year: 2013-2021)



Left: Average proportion of creative companies (2013-2021)

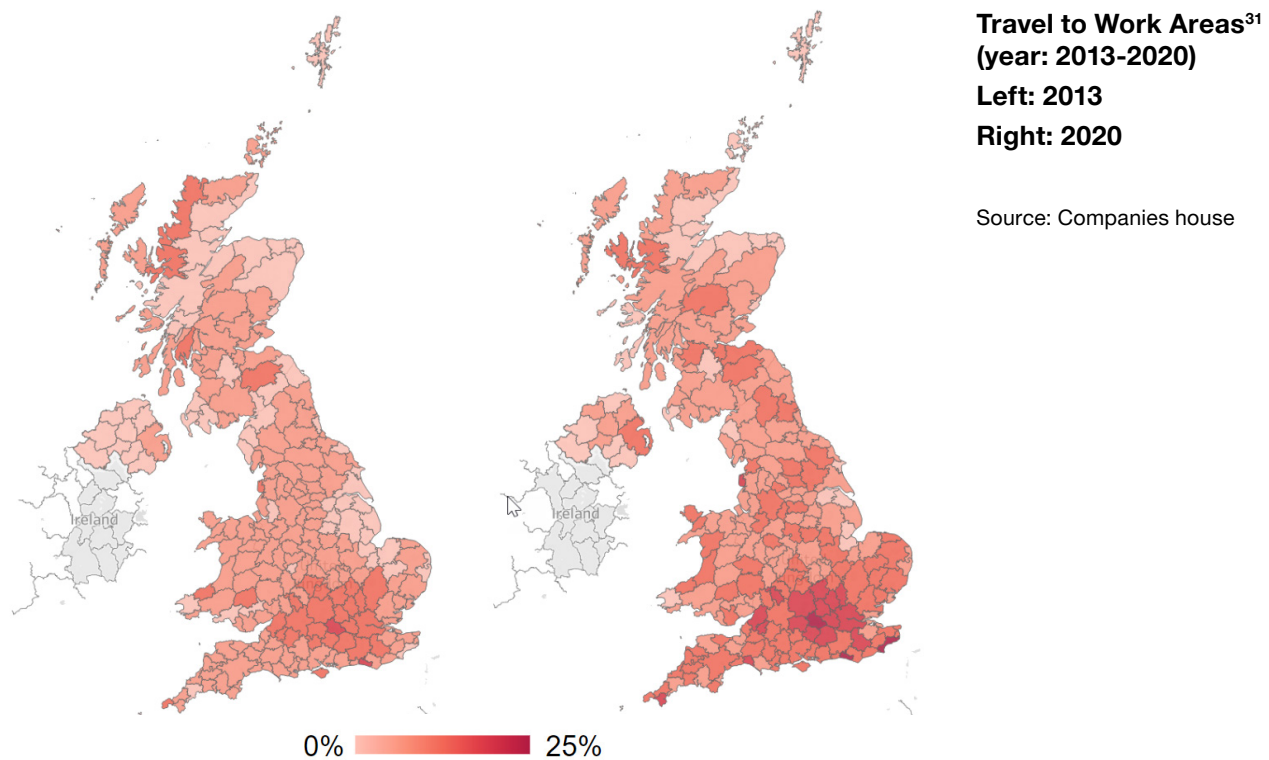
Right: proportion of workers in creative sector (2020)

Source: Companies House, Nomis

²⁹ Both diagrams have been calculated using the DCMS definition of creative industries, note Companies House data for 2015 was missing

³⁰ TTWA are areas defined by the ONS as areas in which 75% of the resident workforce work in the area and at least 75% of the people who work in the area also live in the area. The area must also have an economically active population of at least 3,500. In the diagram, the darker the shade, the stronger the creative clustering in the area

Figure 2 – Evolution of creative clustering (proportion of creative companies) across UK regions



Creative clusters in the UK have been growing (Figure 2 above). In 2013 only 27 TTWAs had over 10% of all companies being classed as creative; by 2020 this number had increased to 89. Whilst longstanding creative clusters in London and the South East are very established, there are now examples of creative clustering across the entirety of the UK. Creative employment growth has been largely driven by growing creative clusters such as Bristol – where employment in creative industries grew by 74% over the period 2015-2020 – but benefits have spread across local economies as diverse as Cardiff, Glasgow and Birmingham, which saw employment growth of 27%, 16% and 13% respectively.

Over the period analysed, 215 out of the 228 TTWAs have seen their creative activity increase, with 27 exhibiting positive year on year growth in the proportion of creative companies in the area every year from 2013 to 2020; this group included many well-known creative hotspots such as London, Cardiff or Belfast, all of which have a large BBC presence³².

³¹TTWA are areas defined by the ONS as areas in which 75% of the resident workforce work in the area and at least 75% of the people who work in the area also live in the area. The area must also have an economically active population of at least 3,500. In the diagram, the darker the shade, the stronger the creative clustering in the area.

³²For instance, in Cardiff there has been a 54% growth in the creative sector since 2012, when the BBC opened Roath Lock, a new studio centre in Cardiff Bay; Source: <https://www.bbc.co.uk/aboutthebbc/documents/levelling-up-and-the-bbc.pdf>

Dynamics of cluster development

The growth in creative clusters across the UK is in part driven by the high levels of growth seen in the sector more broadly (which has outstripped UK average growth over the period). Furthermore, creative clusters are also becoming more geographically diffuse across the UK³³. London has by far the greatest number of creative workers, and also as a proportion of its workforce, but the North West and the South West experienced the fastest growth in the number of people employed in artistic, literacy and media occupations between 2013 and 2019³⁴. Though there is still a long way to address the gap between the clusters in London and South East England, the clusters being developed in other regions, though at different stages of development, are growing and becoming more sophisticated – with more relative concentration of creative firms with respect to the size of their economies.

Within the audiovisual sector the BBC has led the way in pushing more of its investment across the UK. As Chapter 2 explores in greater detail, the BBC's investment skews far more regional than the sector average – half of the BBC's economic impact is out of London compared to only 20% for the industry average.

Combining two measures of cluster formation (using ONS GVA data) allows us to observe where clusters are forming and where they are strengthening³⁵:

- **Location quotients**³⁶ identify the concentration of creative industries in an area;
- **Local effects**³⁷ to identify the growth of creative industries in an area;

Several locations are now characterised not only by high concentration of creative industries, but also high growth (Figure 3) – Greater Manchester South West is a region of a dynamic cluster that is growing. Other locations are more nascent in their development but growing quickly – an example of low current concentration and high growth of the cluster is around Chelmsford. This all means that in addition to longstanding hotspots in London and the South East creative clusters are now well established and developed in other areas.



³³ This is consistent with our findings from Companies House data, depicted in figure 2.

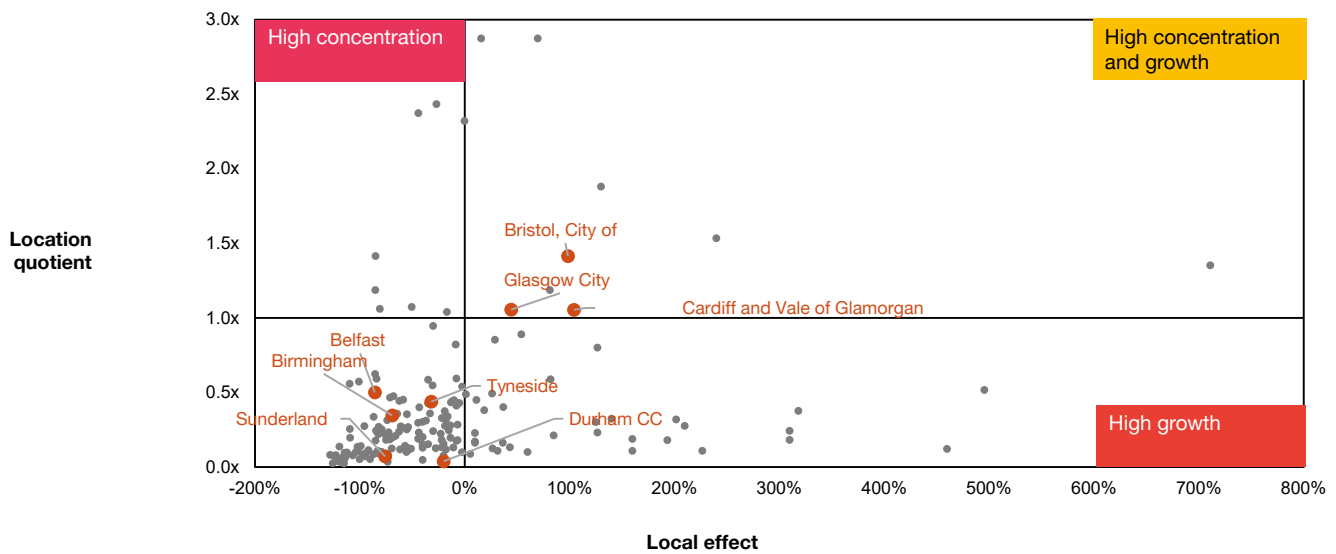
³⁴ While regions such as the North West, South West and East Midlands don't currently have a large share of workforce employed in creative industries, occupational data suggests that there has been strong growth in the number of workers with the relevant occupational skills.

³⁵ Note that unlike the analysis presented elsewhere in this report, these figures are aggregated by industry and Local Authority District Unit (LADU); this is because the underlying data is not available at TTWA level. We favoured TTWA in our econometric analysis as the sample sizes were far more robust.

³⁶ A score over 1 indicates the creative sector is overrepresented in the region relative to the rest of the country ('High concentration')

³⁷ A score over 0% indicates the sector is growing faster in the region than in the rest of the country ('High growth').

Figure 3 – Creative clustering across UK local economies³⁸



Source: ONS, PwC analysis

As described in section 1.1 factors that make specific industries cluster and grow include proximity to clients, proximity to suppliers, critical mass of firms in the sector, proximity to social networks, and strong governance structures and development strategies³⁹. More and more locations now seem to be reaching the critical mass (in terms of skills and investments) required to develop into successful creative clusters. Once a certain level of localisation of activities within a single industry is achieved, the growth of clustering is self-reinforcing, due to agglomeration economies and knowledge spill-overs. Growth in employment and innovation (e.g. patenting) tends to take place in places that were already innovative⁴⁰. In the creative sectors, there are locations with already established concentrations of creative industries that are seeing high growth; this characterises creative clusters such as Bristol, Glasgow and Cardiff.

1.3 Specialisation of clusters across the UK

Creative industries are growing and clusters are developing in many regions across the UK, but each of these clusters are characteristically different, with different groups of creative subsectors dominating each cluster.

Previous evidence suggests that there would be several creative ‘micro-clusters’ spread across the UK⁴¹. How fast a cluster in a specific location will grow, or how successful they will become, depends on their specialism.

Those clusters that are more likely to succeed are those that create agglomeration benefits around specific high-value industries. Not all clusters are growing; Oxfordshire is an example in Figure 3 with a current high concentration of creative firms and employment (particularly in publishing, broadcasting and TV production) but activity is actually declining – the same is true of Lewisham and Southwark and other clusters. Such locations may have already peaked in their current cluster specialism. Evidence suggests that the high growth observed in some locations in Figure 3 is driven by a small number of creative sub-sectors; for example, the cluster in Cardiff is centred around a high level of ‘publishing, film and TV production and broadcasting’ (Figure 4), a key location for growing BBC investment.

³⁸ These data is for the sub-sector of publishing; film and TV production and broadcasting.
³⁹ Komorowski, M and Picone, I, Creative Cluster Development, 2020.
⁴⁰ See Mercedes Delgado, Michael E. Porter, Scott Stern, Clusters, convergence, and economic performance, Research Policy, Volume 43, Issue 10, 2014, https://static1.squarespace.com/static/53d52829e4b0d9e21c9a6940/t/54d170f4e4b080c2b46986ff/1423012084213/DPS_Clusters_Performance_06232014.pdf
⁴¹ The PEC report (2020) identified 709 distinct creative “microclusters”. These were identified using a big data exercise by scraping 200,000 websites of creative industries organisations and running an algorithm to identify where there were clusters of at least fifty creative industries organisations in an area. The results showed that these microclusters are spread widely across the UK. One-third are outside of the 47 major creative clusters that have widely been identified in the past.

The 'IT and software' subsector is the creative industry that employs the largest absolute number of workers across several cities. But what determines specialisation is the share of people employed in specific creative subsectors relative to what would be expected in a city of similar size (given the UK's economic structure). Figure 4 shows employment patterns across a selection of UK creative clusters (more detailed data of employment by sub-industry of specialisation can be found for selected cities in statistical city profiles in Annex 1).

Creative employment in Bristol, for instance, is proportionally larger than the UK average in many creative sub-sectors, from design to publishing (as identified by location quotients above 1). But the subsector that is particularly 'over-represented' in Bristol (i.e. taking a share of local employment that is unusual in other UK cities) is 'Film, TV, Video and Radio' as might be expected given the long-standing presence of the BBC in the city, notably its world-class Natural History Unit; meanwhile, the Birmingham cluster is dominated by 'advertising & marketing'.

Figure 4 – Location quotients for creative employment in a selection of cities⁴²

Source: PwC Analysis using data from ONS (2020)

	Birmingham	Bristol	Cardiff	Glasgow	Newcastle
Advertising & Marketing	1.63	1.33	0.27	1.02	0.51
Architecture	0.92	1.40	1.50	1.36	1.05
Craft	8.72	0.27	0.00	0.55	0.42
Design	0.65	1.38	0.59	0.68	0.62
Film, TV, Video, Radio	0.82	2.04	2.17	1.57	0.78
IT, Software & Computer Services	0.63	1.71	0.52	1.18	1.23
Museums, Galleries & Libraries	0.63	0.99	1.81	1.00	1.06
Music, Performing & Visual Arts	0.91	1.50	1.94	1.47	1.36
Publishing	0.34	1.98	0.64	0.80	0.38
All Creative Industries	0.80	1.65	0.96	1.20	1.00

LQ > 2
 1 to 2
 0.5 to 1
 <0.5

As creative clusters develop and grow, the quality and productivity of these clusters will continue to increase, generating spill-over effects on other clusters. For instance, media presence has become integral to business operations, especially marketing, so as talent increases in the creative cluster, there will be further advances with tech and creative partnerships helping to grow tech dominated clusters.

Section 2 of this report demonstrates that BBC presence in an area is positively associated with creative cluster development. It further shows that whilst BBC presence is most associated with development of creative clusters in sub-sectors directly relevant to its activity, we also find evidence of a positive impact on other creative sub-sectors.

⁴² Belfast is not included in the chart because there is no comparable data for Northern Ireland held by the ONS.

2

The role of the BBC in developing creative clusters



Highlights:

- BBC's activity spans much of the UK, with increasing presence out of London: in 2007, 33 percent of commissioning spend took place out of London; by 2021 the figure had increased to more than half (54 percent).
- A 15% increase in the BBC's local footprint approximately doubles the rate of creative cluster growth over time.
- As the scale of the BBC's presence increases within a local economy, firms in related creative sub-sectors have an increased tendency to locate close by.
- The investments and activities of the BBC across UK regions are large and diverse, and the impacts on cluster development can be even larger than the impacts quantified here. Numerous examples show that the BBC has substantially contributed to the development of creative clusters across the UK, attracting investments, transferring knowledge, creating partnerships and developing skills.

As is demonstrated in Section 1 of this report, the creative sector has become increasingly important to the UK economy, and is an important driver of regional growth. It is additionally clear that creative clusters play an important role in this economic activity. This section presents analysis on the BBC's role in the development and growth of creative clusters across the UK.

2.1 BBC's role as an anchor institution

The nature and reach of the BBC's operations, activities and investments across the UK confirm the key role that it plays within the creative sector, and the UK economy in general. Furthermore, these attributes also suggest that the BBC can play a key anchoring role in the attraction of business and investment into creative clusters.

Examples abound across the regions showing how the presence of the BBC in local economies can support creative clustering in multiple ways:

- **Attract funding and investments**
- **Transfer Knowledge**
- **Facilitate networks and partnerships**
- **Strengthen the talent pool**

BBC's investments often have the explicit goal of promoting the growth of hubs (i.e. clusters). For instance, Cardiff Central Square, which opened in 2022 at a cost of £120m, is designed to be a hub for the wider creative sector⁴³. It comprises BBC Wales, BBC Network teams, S4C, the National Film and Television School and facilities for independent production companies. Furthermore, with its Across the UK plans, the BBC is expanding the range of roles and creative output based in Cardiff with teams involved in News, Science and Digital taking up residence in Central Square.

The BBC also influences cluster development indirectly. The BBC has expertise across numerous creative industry sub-sectors which are being developed in different local economies across the UK. This means it can transfer knowledge to other sub-sectors and complement specialised clusters (beyond the audiovisual sector) in order to advance the area at a faster rate, an ability BBC holds due to its scale and scope. For example, if a cluster specialising in museums, galleries and libraries continues to grow, a significant BBC presence is likely to increase the propensity for the visual arts sub-sector to grow alongside it.

The BBC convenes almost 500 partnerships and collaborations across the UK, often using its local hubs to deliver these by connecting with local authorities, museums, training organisations and tech firms⁴⁴. This convening power for the BBC is one of the key soft power routes through which it can effect change in the creative industries. Partnerships with local authorities are key to shape the development of clusters via joint ventures or initiatives that facilitate collaborations with private sector and other local stakeholders. Working closely with Cardiff Council has been instrumental in facilitating BBC Central Square and other, more recent initiatives like BBC 6 Music Festival⁴⁵ (Box 1 offers additional local examples of how such partnerships operate in practice).

⁴³ The BBC's move to Central Square was predicted by BOP contribute an additional £1.1bn in GVA and over 1,900 jobs over its first 10 years. In terms of network television spend, the BBC regularly exceeds its regulatory floor which stipulates that 5% of Network spend is spent in Wales.

⁴⁴ Annual Report and Accounts – [FN: ARA 21/22 page 74]

⁴⁵ The BBC has entered into a wide ranging partnership with Creative Wales with the aim of building a sustainable, vibrant, diverse and world class creative industries sector in Wales that excels in the production of a wide range of content. This will see joint investments in training, talent development and productions.

Box 1 – Creative Partnerships

Growing the Northern Ireland production ecology

BBC's commitment to investing in Northern Ireland⁴⁶ is already seeing a boost in creative activity. BBC investment in Northern Ireland's independent production sector has generated hit shows such as *Line of Duty* and *BBC One Drama Bloodlands*, putting Northern Ireland on the map as a key destination for production.

Such success is supported by an ambitious and wide-ranging series of projects and collaborations for the strategic development of BBC network output including: training and mentoring initiatives; co-ordinated funding and a commitment to indigenous minority language output and skills development in this area. Diversity and inclusion is at the heart of such collaborations: including digitisation and accessibility (e.g. collaboration on a digital-based traineeship with Belfast Metropolitan College); joint work on an employability initiative with people from disadvantaged areas, providing training, mentoring and other opportunities linked to the creative industries (e.g. shared activity on Bitesize resource materials for local schools, including a Moving Image Arts qualification).

A key partnership is the one with Northern Ireland (NI) Screen – including the BBC's programming in Irish and Ulster-Scots and funding to develop and commission a significant factual series and support development of proposals in Comedy. NI Screen will invest in key BBC commissioned productions where these meet its investment criteria, with a particular focus on Scripted and high-end Factual/Entertainment. Between 2013 and 2019 the partnership has supported 65 productions and supported 16 companies with development funding.

North East Screen Industries Partnership

The BBC has helped form the North East Screen Investment Partnership (NESIP) working in partnership with 12 local authorities and three combined authorities to develop the creative industries: investing at least £25m from 2022 to 2027 in new content development across daytime, factual and BBC Three⁴⁷, and has already brought 12 commissions to the region since announcing its commitment in September 2021.

On the back of these efforts, in May 2022 Newcastle upon Tyne became the first BBC City of Comedy, hosting the BBC's first Comedy Festival for indie producers, for anyone with a new career in TV and comedy, and people looking to break into or advance their career in the industry.

Partnerships with wider stakeholders have supported these achievements. BBC Comedy in partnership with the North East of England's creative industries development agency North East Screen and Hat Trick Production has established a scheme to support the growth of the scripted comedy supply base in an underserved and underrepresented region. It will pair new independent production companies with experienced companies to co-develop a comedy slate.

Alison Gwynn, Chief Executive of North East Screen has commented: **“We are delighted that comedy in the region is being supported in such a huge way. We hope by working closely with BBC Comedy and comedy giant Hat Trick we can bring opportunities to regional talent developing knowledge, skills and networks. The partnership will be a catalyst for growth in the sector and we're excited to see local talent flourish⁴⁸.”**

⁴⁶ A minimum of 3% of its commissioning spend.

⁴⁷ It is also creating a new tech hub in Newcastle creating 70 digital jobs.

⁴⁸ Source: <https://www.bbc.co.uk/mediacentre/2022/bbc-comedy-regional-partnership-scheme>

Areas of high cluster growth such as Bristol, Glasgow and Cardiff (as described in Section 1) are also areas that feature a heavy BBC presence, both in terms of employment and supply chain spending, serving as indicative evidence for the BBC's role in the formation of creative clusters. However, the size and breadth of the BBC footprint across the UK can drive economic benefits across regions beyond the immediate creative cluster – for example, much of the television production in Scotland is enabled by the fact that it has an ecosystem of Public Service Broadcasters based locally with BBC Scotland and BBC Alba at the centre⁴⁹.

⁴⁹ As the home to STV, Scotland is the only part of the UK with its own national 'affiliate' of ITV. Channel 4 and Channel 5 also have operations within Scotland. The screen sector in Scotland generated an estimated 10,280 FTEs of employment for Scotland's economy in 2019. Of this total employment impact, the direct employment impact was 7,070 FTEs. These direct impact FTEs include the crew and cast employed on film and TV production projects and people employed at production companies, distributors, cinema exhibitors and film festivals, and at TV broadcasters in Scotland. <https://www.screen.scot/binaries/content/assets/screen-scot/funding-support/research/final-economic-value-of-screen-sector-in-scotland-report-23.6.22.pdf>

The attributes of the BBC that make it a potentially suitable anchor institution are consistent with those identified by the 2022 UK Government Levelling Up White Paper, particularly those that facilitate knowledge and collaboration – which is how other types of anchor institutions like leading universities and other 'research powerhouses' such as innovation catapults and knowledge transfer networks facilitate clustering. Facilitating access to specific skills is a key ingredient for the expansion of the creative industries, and also for knowledge transfers and innovation. For instance, the BBC's partnership with the University of the West of England to invest in the supply of creative talent to the Bristol and Bath region, creates opportunities for local people and people across the UK to get into filmmaking⁵⁰ (Box 2 describes more broadly the anchoring role played by the BBC in the region).

⁵⁰ The BBC's NHU and UWE Bristol have been collaborating on a Masters course in Wildlife Filmmaking for almost ten years, and an MA in Documentary Production is partnered with Plim-soll Productions. Around 159 students have graduated from the course with an employment rate of 97% in recent years with students being offered employment head of graduation. Students are regularly shortlisted for the BAFTA Student Awards against a global competitive field.



Box 2 – BBC as an anchor in Bristol and Bath⁵¹

BBC has acted as an anchor institution in the Bristol and Bath creative cluster for 65 years, crowding in investment into the region from other media organisations. Also, many former BBC staff have used their experience gained at the BBC to create successful businesses across the media supply chain in the region.

Bristol's strengths in natural history, factual, animation, and post-production originally developed because of the BBC and Aardman acting as the creative anchors of their respective sub-sectors. More recently the Landmark series of natural history productions underpinned by BBC public service investment has allowed BBC Studios Natural History Unit (NHU) to invest in growing its production capabilities to attract investment to the region from other commissioners including Apple TV (Prehistoric Planet, The Year Earth Changed) and NatGeo (Ocean Xplorers). The NHU is now the world's largest wildlife production unit and, together with the cluster of companies creating natural history programmes that have grown up around it, has earned Bristol the title of the 'Green Hollywood'⁵².

The natural history and factual sub-sectors developed around the NHU and other departments based at BBC Bristol, while Aardman's growth seeded the animation grouping initially around its Spike Island dockside base. The expanding production of these genres in turn supported the growth of Bristol's small but essential post-production sub-sector. Much of the city's facilities and branded content sub-sectors then developed as a result of the combined size and gravitational pull of Bristol as a regional and national production hub.

Many of Bristol's natural history companies have been established by former NHU executives, including Silverback Films (Alastair Fothergill and Keith Scholey), True to Nature (Wendy Darke) and Wild Space (James Honeyborne). Being concentrated in Bristol gives each company a significant advantage over competitors based elsewhere, largely through its unrivalled pool of experienced creative talent. As explained by Grant Mansfield, the founder and chief executive of Plimsoll Productions (the president of which, Andrew Jackson, also led the NHU): 'the truth is that most of the world's best wildlife film makers live and work in this city'.

As with natural history and post-production, Bristol's factual sub-sector has grown up around the BBC Bristol's historical base in Clifton on Whiteladies Road. Today, although factual companies are to be found throughout the city centre, the majority remain concentrated in Clifton. These include new firms like Bone Soup, Five Mile Films and Mustang Films as well as more long-standing factual indies such as Drummer TV, Keo West, Love Productions, Quickfire Media and RDF West. Bristol's factual companies often developed from the natural history sub-sector and have prospered by diversifying into factual – Icon Films and Plimsoll are good examples of this trend, as is Hungry Gap, the new firm set up by former Tigress executive, Pete Lawrence.

BBC NHU is a key player in the future economic development of Bristol and Bath that is more inclusive and innovative. It has just invested in new facilities and offices in the centre of Bristol bringing the benefits of the creative cluster to the heart of the city⁵³. This helps shift the historic centre of the city's screen industries away from the predominantly white, wealthy suburb of Clifton. This is considered to be a small but important step forward in the city's struggle to address the lack of diversity in its production workforce. Also, BBC Natural History Unit is at the forefront of innovation and technology in nature and wildlife filmmaking creating wider spillovers for the rest of the industry and the economy: for instance, BBC Springwatch in 2021 was the first live programme wholly powered by off grid green hydrogen generators, showcasing the use of the technology for wider industry and wider social and environmental benefits. Finally, the corridor between Bristol and Cardiff is enabling the BBC to invest more in the Cardiff creative cluster, in particular leveraging its knowledge and skills in nature and wildlife filmmaking to establish Cardiff as its national science and climate hub.

⁵¹ This case study uses information obtained from the study by Spicer, A., Presence, S., & Frymus, A. (2022). GO WEST! 2 Bristol's Film and Television Industries. Bristol: UWE Bristol UWE (2022).

⁵² The NHU embarked on a series of high profile 'landmarks' featuring or narrated by David Attenborough, from The Living Planet (1984) and The Trials of Life (1990) to Planet Earth (2006) and A Perfect Planet (2021). These extremely expensive 'blue chip' programmes are now co-produced with a variety of companies, principally American ones such as Discovery. They are marketed internationally by BBC Studios' distribution division, under the brand BBC Earth.

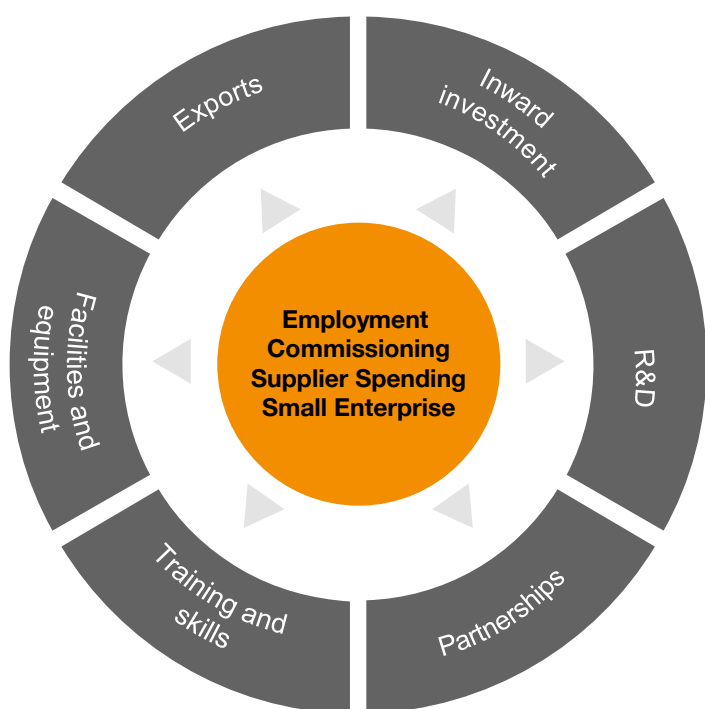
⁵³ In early 2021, it was announced that Studios' staff – that is, the NHU and Bristol's Factual Entertainment unit – would be relocating to three floors in the Bridgewater House building at Finzels Reach, a stone's throw from the new Channel 4 base in the city centre.

In short, recent experiences in local economies (together with evidence of how other types of clusters develop) suggests that creative clusters are likely to grow faster where the BBC's presence is larger. **This is the first study to systematically demonstrate empirically, with comparable data across local economies, that the BBC is helping develop creative clusters across the UK.**

The rest of this section offers an overview across local economies of the data and measures used for the empirical analysis and then summarises the impacts of such BBC activity on clustering using an econometric model.

2.2 Overview of BBC activity across the regions

As demonstrated in the preceding section the BBC's investment and activities across the UK's creative clusters are large and diverse – from employing directly and indirectly thousands of creative workers, commissioning content from the independent production sector, hundreds of local partnerships, investment in world class facilities and equipment to the promotion of audio-visual exports through BBC Studios and using the BBC brand to attract inward investment. Many of these activities are interrelated and interdependent. It is therefore complex to measure the presence of the BBC through all of these activities individually.



Guided by the data that is available to consistently compare BBC presence across local economies, the size of BBC's activities is approximated by measures of its local workforces and by how much it spends in procurement. Commissioning spend is an increasing part of BBC spending power and has been shifting out of London. Furthermore, these measures serve as indirect indicators ('proxies') for other activities that grow on the back of a large BBC presence such as the level of BBC's investment⁵⁴ and also the creation of partnerships with local businesses and authorities.

The empirical analysis of this study focuses on the impacts of BBC's operations, as measured by

- **The level of its workforce in each TTWA across the UK**
- **Supply chain (procurement) spend in such local economies**

We have focussed on these metrics as a proxy for the wide range of routes through which the BBC may impact cluster development, as (a) the BBC holds detailed and consistent data on both of these measures, and (b) they provide a consistent view over time on the intensity of activity across the UK. As the quantitative analysis uses only these metrics the impacts of the BBC on cluster development can be even larger than the impacts quantified here.

BBC regional employment

The BBC has for a long time been a large employer within the UK economy. Our data indicates that as of January 2022, the BBC had approximately 20,000 employees under contract, across 74 of 228 TTWAs in the UK.

The analysis presented in this report uses pooled annualised cross-sectional BBC employment data comprising salary bands and location of employment for all BBC employees from 2011-2022⁵⁵. Over the 12 years analysed, London was the most common place of work, with 47% of employees being based in the city (on a declining trajectory), above the sector average of approximately 34%, followed by Salford with 14% of the BBC workforce, which is well above Manchester's average share of creative employment of 4.1%.

Figure 5 shows the level of BBC employment spending between 2011 and 2022 by TTWA⁵⁶. As demonstrated, BBC employment spend is focussed across its major offices such as London, Salford (Media City) and areas such as Bristol and Belfast.

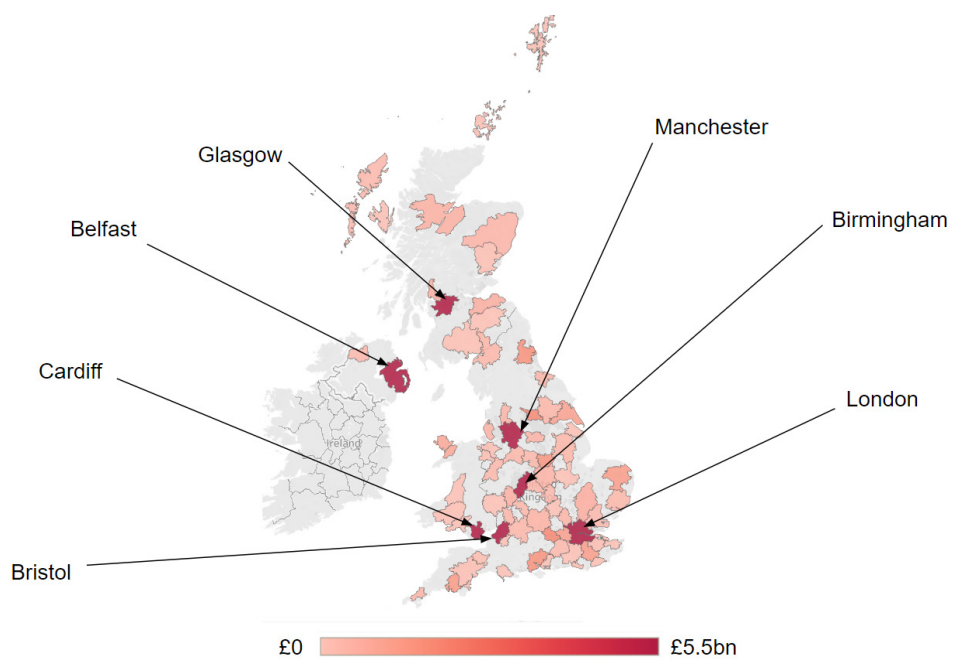
⁵⁴ For instance, the BBC has been investing in production in Wales since BBC Cymru was established in 1964. The BBC began investing heavily in Wales and the Cardiff bay from the late 2000's having building on its long term presence in the city. In Wales, the BBC contributes over £200m in GVA and over 2000 jobs annually.

⁵⁵ The data shows the salary bands and areas in which over BBC employees worked from 2011-2022, with over 210,000 observations accounting for approximately £9bn spend.

⁵⁶ The darker colour indicates a higher level of BBC spending.



Figure 5 – Total BBC employment spending across UK local economies (2011-2022)
 Source: BBC

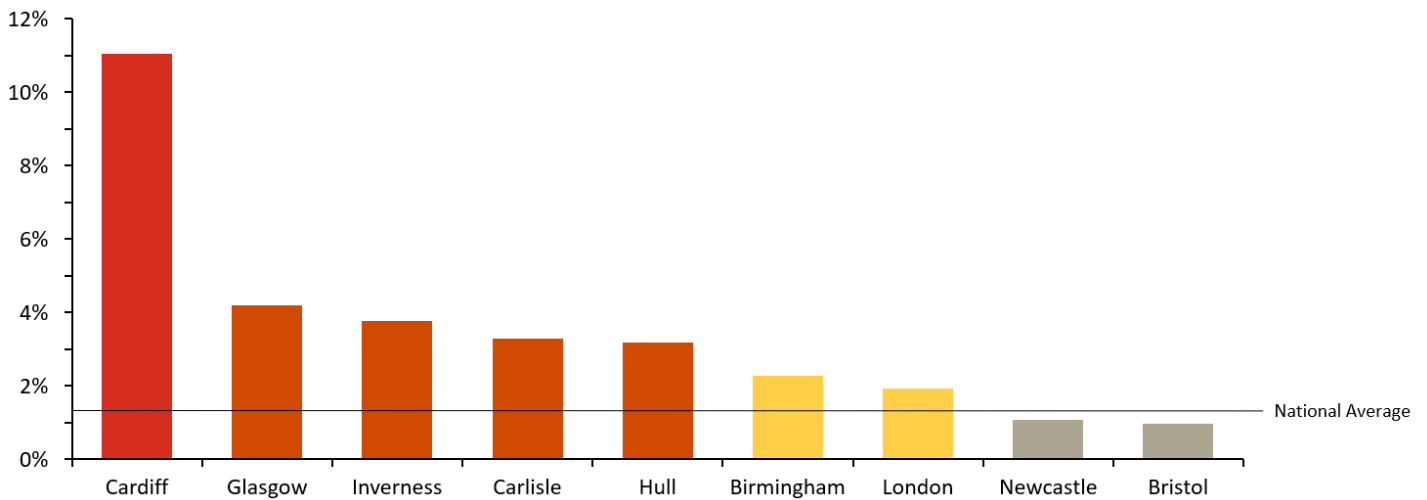


Given that London is the most populous city in the UK, and therefore represents the TTWA with by far the largest population and quantity employed, and has been the focus of creative sector growth in the past, it is not necessarily informative that a large number of BBC employees work there; a more informative metric is BBC employment in each area relative to the size of the labour market in that TTWA (Figure 6).

Figure 6 – BBC employment in a selection of local economies (2020)⁵⁷

Source: BBC data, ONS, PwC analysis

BBC employment as a % of total creative employment



As a percentage of total creative industry employment, it is Cardiff who led the way in 2020, where approximately 11% of those who work in creative industries work for the BBC. As noted in Section 1 (Figure 4) Cardiff is highly specialised in ‘Film, TV, Video, Radio’, and the BBC forms a large part of the sector. In Bristol while it has a strong specialisation in ‘Film, TV, Video, Radio’ it has been an established creative cluster for longer and also has a much broader coverage of the industries that make up creative sectors, as a result the BBC is a smaller part of a much wider creative economy. This was followed by Glasgow and Plymouth with approximately 4%. This is significantly larger than the approximate 2% in London.

As well as increasing the supply of skilled labour to local economies through employment, the BBC provides training opportunities for its staff and industry through a number of industry schemes, transferring knowledge to the wider sector. The BBC Academy, headquartered in Birmingham, has provided online and face-to-face training to thousands of industry professionals in areas such as journalism, writing and 360-video since opening in 2009. In 2021/22 the BBC ran over 45 talent schemes, bursaries and targeted initiatives, 63% of which were outside of London. This includes the BBC Writersroom, new talent programme for those breaking into the industry in behind the scenes roles, New Documentary Directors scheme and Elevate which offers those with disabilities production placements to progress their career.

⁵⁷ Belfast is not included in the chart because there is no comparable data for Northern Ireland held by the ONS.

BBC procurement spending

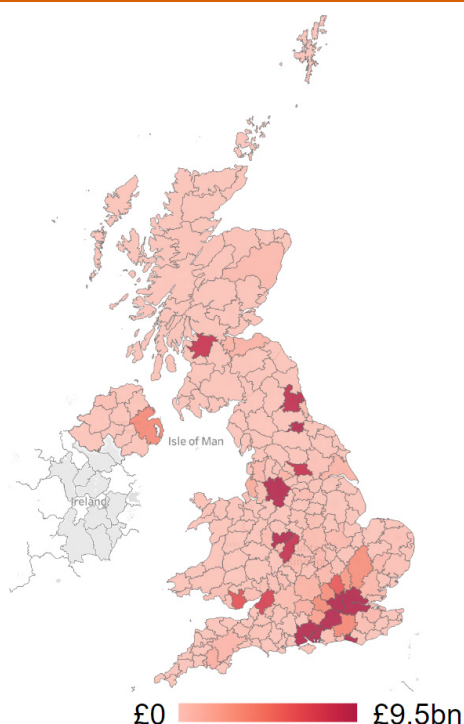
We analyse BBC procurement data, disaggregated by TTWA and SIC code of supplier from 2011-2020. The data shows that over the period the BBC spent approximately £18.6bn. This demonstrates the power the BBC has as a direct provider of spending in local economies, distributed across a wide range of businesses.

Similarly to the employment data, London-based firms receive the highest overall level of procurement spending from the BBC.

However, the reasoning for this is similar: London represents the most populous and economically active TTWA. The overall BBC procurement spend is geographically diffuse, with some level of spend occurring in 225 of the 228 travel to work areas between 2011-2020 (Figure 7). The BBC provided a significant injection into many areas, for example the BBC spent approximately £1.3bn in Wolverhampton and Walsall alone over the period analysed. Other areas that have benefited from BBC spending include Manchester and Darlington, which accounted for over £700m of spending each.

Figure 7 – Total BBC Procurement spending across UK regions (2011-2020)

Source: BBC



The regional map shows the level of BBC procurement spending over the period by TTWA.

As shown the BBC used its purchasing power to spend across the UK, illustrating the transformative impact the BBC can have over the whole of the UK.

In areas such as London, Bristol and Reading where both HR and procurement spending are very high, there is significant creative clustering⁵⁸. This was further shown in growth areas such as Cardiff, Redruth and Truro, and Slough, where there was growth in procurement spend, employment spend, and creative clustering in the majority of years⁵⁹. This suggests that there is a small amplifying effect as areas that have attracted both growing HR and procurement spend likely result in a growing cluster.

By analysing BBC procurement spend over time we observe which regions experienced creative industry growth in tandem with growth in BBC procurement spending. For example, in Swansea BBC procurement spending increased every year from 2011 to 2020. This was broadly reflected by similar increases to the level of clustering, with the share of creative companies growing every year from 2016 to 2019.

As for Network TV commissioning spend, it represents an increasing part of the BBC spending power and it is shifting out of London. In 2007, 33 percent of commissioning spend took place out of London; by 2021 the figure has increased to more than half (54 percent). Furthermore, the increase in spending in recent years has mainly taken place outside of England – with Scotland, Northern Ireland and Wales all experiencing an increase in commissioning in absolute terms, and as a proportion of total commissioning spending, with these three nations tripling in 15 years the proportion of commissioning they capture among them – in 2021 representing 20 percent of the UK total (Figure 8). The BBC commits, for instance, to investing a minimum of 3% of its commissioning spend in Northern Ireland and will seek to exceed this baseline particularly on the back of successful partnership like the one with Northern Ireland Screen, which strengthens BBC's programming in Irish and Ulster-Scots and is developing and commissioning a significant factual series and supporting development of proposals in Comedy. BBC's commitment to investing in Northern Ireland is already seeing a boost in creative activity. BBC investment in Northern Ireland's independent production sector has generated hit shows such as Line of Duty and BBC One Drama Bloodlands, putting Northern Ireland on the map as a key destination for production.

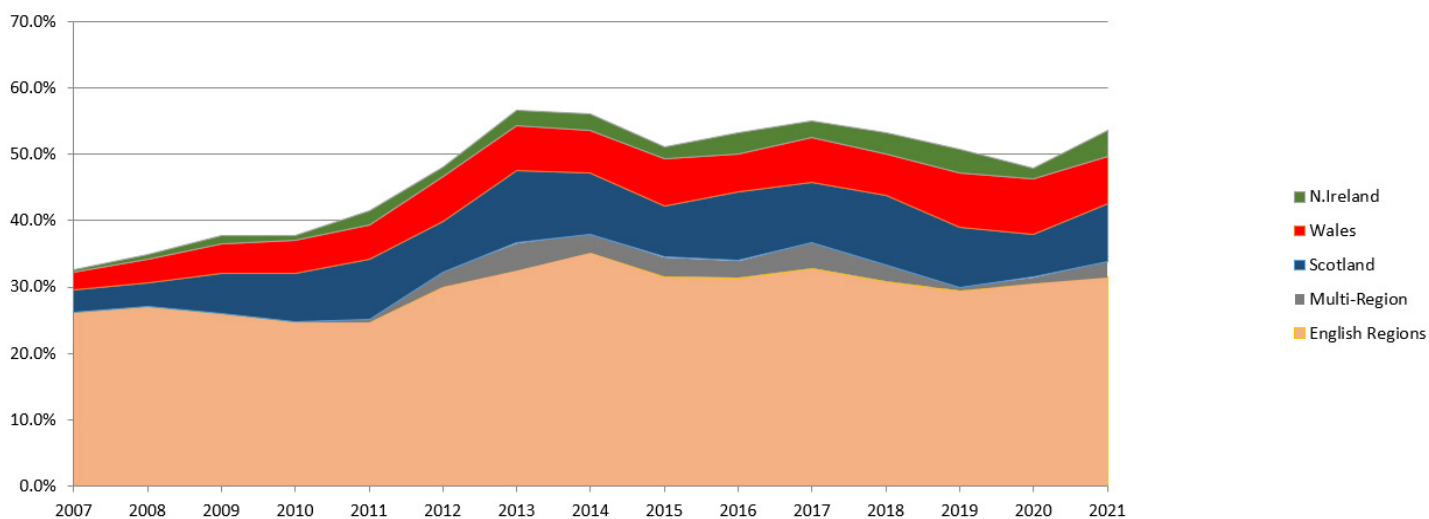
⁵⁸ High being in the top 20 TTWAs for BBC spend and also creative cluster by proportion of firms

⁵⁹ Shown by year on year growth in at least 4 of the years



Figure 8 – Network TV Commissioning spending over time out of London

Source: BBC Made out of London quotas



This shift in the location of commissioning spend has been accompanied and enabled by a shift in the locus of BBC decision making, meaning local BBC commissioners are driving local creative economies through their spending power and professional networks. The BBC has increased the number of Network commissioners based across the UK to 24. Every BBC genre now has network commissioning leads for each UK nation. In 2021/22 the BBC appointed four new Drama Assistant Commissioners based in Cardiff, Belfast, Glasgow and Salford, a new Daytime Commissioning Editor based in Newcastle, a Documentary Commissioning Editor in Leeds and a Head of New Writing based in York, along with an expanded Writersroom presence in Salford.

These key personnel are critical to building relationships with local suppliers, particularly independent production companies. In 2021/22 the BBC used its local presence to hold 11 targeted briefings for nations and English regions producers to maintain the creative health of the sector outside of London.

As well as cultivating local networks the BBC invests locally in building the creative supply chain – through the BBC’s Small Indie Fund it supported 50 companies in 2021/22, with each company paired with a Commissioning Editor to mentor and supercharge their development. Nearly 40 programmes have been commissioned by the BBC from companies supported by the Small Indie Fund.

Box 3 – Econometric methodology

We estimate the impact of BBC employment spending, creative procurement spending, and non-creative procurement spending, on the rate of creative cluster growth at the Travel to Work Area (TTWA) level. The model is estimated by Ordinary Least Squares in first differences, with TTWA fixed effects controlling for unobserved regional characteristics, and a full set of year dummies to account for seasonality. A full discussion of the approach is set out in Appendix 3.

The data is arranged as a panel dataset with observations aggregated annually by TTWA. The analysis presented in this section is required to be compatible with the spill-over impacts in Section 3; that analysis relies on national survey data (Annual Population Survey and Understanding Society datasets). TTWAs were selected as they were found to be sufficiently large such that a sufficient number of creative employees are observed in each spatial unit of those datasets such that the sample was representative.

As a measure of localised creative clustering, we use SIC codes from the Companies House data to calculate the proportion of companies within each TTWA that meet the criteria to be classified as a member of the creative cluster, using both the broad DCMS definition, and the more BBC-specific Nesta definition (as defined in Section 1 above). We use this as our dependent variable for two reasons. First, location quotients would not be appropriate as it would not be possible to detach the BBC contribution from the overall GVA figure. Second, as highlighted in Section 1.2, location quotients are not accurately calculable at the TTWA level.

2.3 Evidence of BBC's impact on creative cluster formation

Combining the BBC Procurement and employment data, as a proxy for the degree of BBC presence in an area, with Companies House microdata⁶⁰, we use a spatial econometric model to analyse the relationship between the BBC and creative clustering (Box 3). The model estimates the impact of changes in BBC employment spending, creative procurement spending, and non-creative procurement spending, on the rate of creative cluster growth.

There are two key mechanisms through which BBC activity might increase the growth of the creative sector in a local area: through the demand for creative resources it generates through its procurement spend, and through agglomeration economies and knowledge spillovers that result from its physical presence in an area. We use localised BBC procurement data to estimate the impact of supply chain spending on creative clustering. Finding a statistical measure of the BBC's presence in an area is less straightforward: the BBC is, to some degree, present in every TTWA in the UK, but it is the extent of that footprint that matters. We therefore use localised employment spending as a proxy for the BBC's physical presence in a local economy.

⁶⁰ Microdata are unit-level data obtained from sample surveys, censuses, and administrative systems. They provide information about characteristics of individual people or entities such as households or business enterprises.

Main Result 1:

The larger the local BBC presence, the higher propensity there is for creative clustering.

A 1% rise in BBC employment spending accelerates the rate of creative cluster growth by 4.5% when creative clustering is measured in terms of the broader DCMS definition. This rises to 6.9% when using the more BBC-specific Nesta definition.

- This suggests that the larger the local presence of the BBC, the higher the propensity for clusters to develop.
- This in turn implies that increases to BBC funding is a highly effective policy instrument for encouraging the creation and development of creative clusters.
- There is a larger relative impact of clustering on creative industries directly relevant to the BBC, however there is a significant positive spill-over impact to the rest of the creative sector.

Main Result 2:

Results are strongly suggestive that it is co-location, not BBC procurement activity, that is important for clustering.

Creative companies are more likely to cluster around BBC bases, not the destination of procurement spending.

- This suggests that it is the size of the BBC's presence in an area as an anchor institution that promotes clustering.
- BBC spending in a local economy without a notable permanent BBC presence does not have a significant impact on clustering.

We do not find a statistically significant relationship between procurement spending and creative clustering. Using both DCMS and NESTA definitions, point estimates of the relationship between creative spending and creative clustering are small and positive, but are not statistically significant. Similarly, point estimates on the relationship between non-creative spending and creative clustering are small and negative (implying a positive relationship between non-creative spending and non-creative industrial concentration); these are significant at the 10% level using the DCMS definition, but not when using the more BBC-relevant Nesta definition.

It should be noted that whilst BBC procurement spend is not found to be related to creative clustering, it does deliver economic value through different channels⁶¹. In 2019/20 the BBC contributed £4.9bn to UK GVA through its economic activity, independent of clustering impacts⁶².

These results strongly support the findings of the Levelling Up White Paper, which, as set out in Section 1.1 of this report, suggests that clustering is catalysed by anchor organisations. The mechanism suggested by the White Paper is that high-skill, high-value-add, industries co-locate with anchor institutions to take advantage of local labour markets and supply chains. It is also proposed that these anchor institutions pioneer the development of new technologies, helping local companies develop and commercialise cutting-edge products and services, boosting jobs, productivity, incomes and international competitiveness. Anchor institutions are typically universities and higher education institutes, but they might also be institutions such as innovation catapults and knowledge transfer networks.

BBC's activity leads to stronger creative clusters because it crowds in investments in different ways. Investments in R&D and innovation are but one example – which also can lead to wider economic benefits as covered below in Section 3. Alongside the work BBC R&D does to support innovation within the BBC it also acts to crowd in partners to enable a wider innovation and unlock funding. BBC R&D works in partnership on large-scale research projects with multiple academic, commercial and local government partners⁶³, in order to support innovation across the UK connected to its mission and public purpose. Over the last 10 years it has supported 206 individual research projects across 32 UK institutions from the University of Falmouth to Dundee University, as well as 14 projects overseas. There are many other channels through which the BBC's impact on clusters translate into wider economic impacts, which are set out in the next section.

⁶¹ Particularly if the creative spend is in an area with an existing creative cluster/BBC presence as it boosts demand from businesses in the cluster.

⁶² An Assessment of the Economic Impact of the BBC, KPMG. <http://downloads.bbc.co.uk/aboutthebbc/reports/reports/kpmg-economic-impact.pdf>

⁶³ Through these, for instance, it has helped secure over £64m in research funding in a diverse range of areas from connectivity and 5G use in rural areas to understanding digital citizenship. Innovating in the use of the latest technologies such as 5G for proof of concept trials such as 5GRuralFirst. As part of a consortium of over 30 organisations, the BBC explored the potential new approaches to the deployment of connectivity in rural areas, which can often suffer from low and unstable bandwidth on both fixed and mobile. Through the use of 5G as a live broadcast medium. With the University of Newcastle Centre for Digital Citizens Digital Economy Hub tackling the challenges of digital citizenship through technology innovation co-created between academic, industrial, public and third sector partners, with citizens supporting co-creation and delivery of research.

3

Impacts of creative clusters on local economies



Highlights:

- Workers in the creative sector earn 9.4% more than workers with comparable levels of skills in other sectors.
- Clustering increases employment, both in the creative sector, and overall, in the local economy. A 1% increase in creative clustering is on average related to a 0.5 percentage point increase in local employment.
- Growth of the creative industries is associated with an increase in working conditions. For instance, workers in the creative sector work 11% less unpaid overtime than equivalent workers in other industries.

A range of econometric analyses were conducted to establish the causal relationship between creative clustering and a variety of economic and social impacts. Overall, we find very strong evidence of a positive relationship between creative clustering and local economic outcomes, particularly in the labour market. Evidence of social impacts is less clear.

A set of economic and social impacts for analysis were identified using a Rapid Evidence Assessment (REA) to establish the pre-existing (largely qualitative) evidence base regarding potential spill-over impacts of creative clustering. This section first briefly describes the (theoretical) impact pathways of creative clustering, followed by the econometric results.

For the purpose of the quantitative research, when we refer to local economies, we are talking about TTWAs. These are actually relatively large geographical areas, which while the vast majority of employment within a TTWA might take place in an urban area the benefits are actually shared across a broader geographical area that includes towns and rural areas that are commutable to clusters. We have done this as it captures places where workers both live and work and TTWAs are sufficiently large that within-year samples of APS and Understanding Society data used in our modelling purposes are representative.

3.1 Theoretical impacts of creative clustering

The main contribution of this research is that it quantifies, using pooled cross-sectional and panel data, the economic impacts of creative clustering.

Previous research in this area has been mainly qualitative, often focusing on specific case studies. This study analyses data across the UK to demonstrate such impacts empirically, particularly on local economic outcomes. The economic impacts covered are:

- Level of Earnings (wages) in creative industries and in other sectors⁶⁴.
- Employment – in creative industries and in other sectors.
- Working conditions, proxied by unpaid overtime; and
- A set of social impacts (including indicators of living conditions such as health).

⁶⁴ Previous research has found multiplier effects on employment in other sectors: with each creative job generating at least 1.9 non-tradable jobs in local services. There was no evidence, though, of spill-overs from creative industries to jobs or firms in other tradable sectors. (source: Mateos-Garcia, Klinger et al. 2018, Tether 2019).

Based on the evidence collected, we built a theory of change that depicts the mechanisms of transmission from inputs (i.e. BBC's activities), to outcomes (e.g. crowding-in investments) to impacts (e.g. effect on local employment). This theory of change is illustrated in Figure 9, below.

In terms of the final economic impacts, we found primarily qualitative evidence that the presence of creative clusters can improve employment, wages and wellbeing in creative and non-creative industries. Various sources observed that creative clusters support employment growth across the UK, partially attributable to the high growth rate in the sector^{65 66}. It has been additionally suggested that high levels of clustering increases visibility of firms, increasing the efficiency of match of worker skillsets to jobs in the labour market i.e. putting the right person in the right job⁶⁷.

There is also evidence to suggest that high concentration of creative firms affects wages, with creative industry employees in cities with high creative clustering receiving a wage premium. This premium is the result of high productivity in the sector, which is heightened further due to clustering⁶⁸.

Clustering not only affects creative industry employees but also those in non-creative sectors and adjacent areas. In one survey, over 60% of respondents felt that creative businesses in their local area helped with wellbeing and health⁶⁹.

Other evidence suggests that greater access to culture and art is positively correlated with an improvement in happiness and general health⁷⁰. These improvements in wellbeing are considered spill-over effects from the betterment of mental health caused by increased interaction with the arts.

Creative clustering benefits non-creative industries through a 'creative push'. This 'push' stems from a creative 'nudging of innovation' where creative business models are spread to businesses in other sectors to increase their innovation and productivity⁷¹. This can lead to higher growth in non-creative sectors and eventually wages. Additionally, greater creative industry presence can improve employment in non-creative industries as cities labelled associated with creative industries attract knowledge workers who may then be employed by other, non-creative, local businesses⁷². This strengthens the local talent pool and may attract more private investment.

Based on this literature, and the availability of data, we build a series of bespoke models to capture the wider impacts and spill-over effects of BBC's activity on creative clustering and subsequently on: employment, wages, working conditions and apprenticeships and also social impacts like mental health, physical health and subjective wellbeing.

⁶⁵ Garcia et al, How the creative industries are powering the UK's nations and regions, 2018.

⁶⁶ Innocenti et al, Do the creative industries support growth and innovation in the wider economy? Industry relatedness and employment growth in Italy, 2019

⁶⁷ Chapain et al, "Creative Clusters and Innovation: putting creativity on the map", NESTA, November 2010

⁶⁸ Bakhshi et al, Capital of culture? An econometric analysis of the relationship between arts and cultural clusters, wages and the creative economy in English cities, 2013. Note, however, that this research did not take individual characteristics into account like 'creativity' which can also affect wages so these results may be biased.

⁶⁹ Virani et al, Creative Clusters, Social Inclusion, and Sustainability: The Case of Hackney Wick and Fish Island, 2018.

⁷⁰ Tom Fleming Creative Consultancy, Cultural and Creative Spill-overs in Europe, 2015.

⁷¹ Chapain et al, "Creative Clusters and Innovation: putting creativity on the map", NESTA, November 2010.

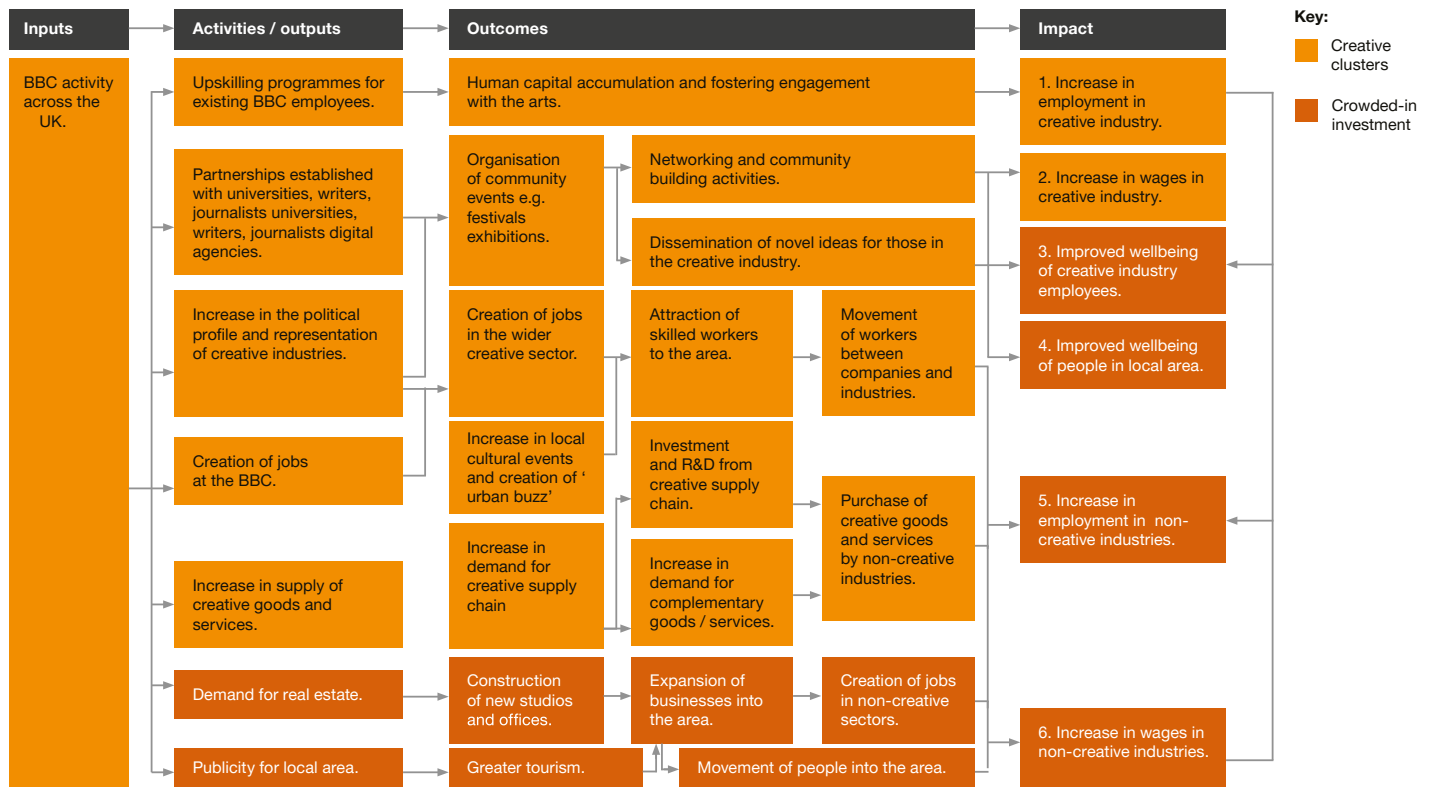
⁷² Chapain et al, "Creative Clusters and Innovation: putting creativity on the map", NESTA, November 2010.



Figure 9 – Impact pathways for BBC activity

Source: PwC analysis

Impact pathways



There are other intermediate outcomes that have not been quantified in this study, largely due to insufficient data, but that have been identified in previous literature as important drivers of benefits for firms and industries – and thus creating the conditions for the local economic impacts quantified in this study. Such benefits include:

- **Knowledge and innovation spill-overs:** previous research shows that creative industries are more innovative than other sectors, but there is a contagion effect where non-creative industry sectors operating in creative clusters tend to be more innovative too⁷³. Creative businesses in sectors such as advertising, architecture and software are heavily engaged in business-to-business activity and therefore are a focal point for creativity, stimulate and support business innovation in the wider economy⁷⁴. These spill-overs can also spread geographically, benefitting adjacent regions rather than hurting them (which might occur if talented people leave to move to the areas with better jobs)⁷⁵.
- **Attraction of high-value enterprises:** past qualitative research has described how regions that draw large proportions of creative workers also draw industries with high-paying jobs, particularly technology industries⁷⁶. This is thought to be due to the productivity gains and increase in creativity and innovation that creative workers bring.
- **Improved talent pool:** participation in collective activities e.g. arts festivals and exhibitions can improve skills and knowledge of practices and develop professional networks – arts and culture institutions can provide meeting places⁷⁷.

These outcomes can be analysed more systematically at the regional level and quantified in future research⁷⁸. For the purposes of this study, they provide us with an understanding of why employment and other economic impacts that are quantified are likely to occur.

The social impacts of the expansion of the creative industries can also be wide-ranging. BBC’s initiatives show several examples of benefits for the cultural life and the wellbeing and flourishing of local populations (Box 4 describes the benefits of festivals). Though these wider impacts are also difficult to quantify in a systematic and comparable way, they are a key ingredient to increasing standards of living.

⁷³ Nesta, J.M, Garcia, J. Klinger and K. Stathoulopoulo “Creative nation: How the creative industries are powering the UK’s nations and regions”.

There are other sectors more likely to use creative inputs and services to produce novel and differentiated products (design, advertising, software, visuals, storytelling to engage customers)

⁷⁴ Firms with stronger B2B linkages with creative industries are more likely to introduce product innovations. See econometric evidence presented by Bakhshi, H., McVittie, E. and Simmie, J. (2008) ‘Creating Innovation: Do the creative industries support innovation in the wider economy?’ NESTA research report, Access: <https://media.nesta.org.uk/documents/creativeinnovation.pdf>

⁷⁵ Nesta, J.M, Garcia, J. Klinger and K. Stathoulopoulo “Creative nation: How the creative industries are powering the UK’s nations and regions”.

There is no evidence of displacement effect. Previous research shows that the development of creative clusters do not create ‘zero-sum games’ across adjacent regions: e.g. evidence shows that if a local region has creative specialisation it increases the likelihood by 80% that neighbouring region will specialise in that sub-sector too.

⁷⁶ See the Nesta report “Creative Clusters and Innovation: putting creativity on the map”, November 2010.

⁷⁷ Centre for Economics and Business Research. “The contribution of the arts and culture to the national economy”

⁷⁸ Nathan et al (2021) argue that the wider evidence base for these spill-over effects is inconclusive, since much of the empirical evidence draws conclusions from single case studies (Bloom, Camerani et al. 2020). The small number of quantitative papers examining the wider impacts of creative industries on urban and regional economies are typically constrained by short time periods, non-causal research designs, or both. Source: Nathan, M et al, Do creative industries generate multiplier effects? Evidence from UK cities 1997-2018, 2021

Box 4 – Bristol wild screen festival⁷⁹

BBC Studios natural history unit is a major sponsor of the festival and it is helping support a more diverse set of activities reaching wider segments of the population.

Wildscreen is a Bristol-based charity founded in 1982 by the ornithologist, Sir Peter Scott, and the former head of the NHU, Christopher Parsons. Wildscreen's stated objective is to bring together natural history filmmakers and conservationists to 'create compelling stories about the natural world that inspire the public to experience it, feel part of it and protect it'. Run by Lucie Muir since 2015, Wildscreen organises Exchange – a global hub that connects conservation organisations with creative wildlife professionals, providing images, videos and expertise; a biennial Festival – that showcases the top talent and distributes the Panda Awards, the industry's top honour divided into various categories; and a Network – to nurture talent and create an 'inclusive community of natural world storytellers', one that will open up natural history filmmaking to a new and more diverse range of voices and perspectives.

Though located in Bristol, Wildscreen's focus is global; over eighty per cent of its sponsorship comes from overseas and it is committed to supporting other wildlife hubs, conservation groups and filmmakers worldwide to deliver events about natural history. Its current focus is on helping to create a more diverse and dispersed range of storytelling voices and on supporting the industry's efforts to reduce its carbon footprint and promoting the use of indigenous expertise, including encouraging Bristol-based filmmakers to mentor emerging talent wherever it is located.

3.2 Quantified economic impacts

The empirical analysis presented below demonstrates that creative clusters bring significant economic value to local areas – particularly through the improvement of labour market outcomes for workers both within the creative sector and in other industries. We find strong evidence to support that creative clustering improves economic outcomes in terms of:

- Employment,
- Earnings,
- Working conditions.

Whereas Section 2 sets out the relationship between the impact of the BBC on clustering, this section sets out the relationship between clustering and spill-over impacts on the economy – putting the two together, the impact of the BBC on local socio-economic outcomes comes in large part via its influence on cluster development⁸⁰.

We combine BBC data and Companies House data with individual-level ONS microdata to quantify spill-over impacts, as identified in the theory of change presented in Section 3.1. In each case we adapt the most current and robust econometric approaches for modelling the outcome in question. Depending on the theoretical impact pathway, we model either the impact of being employed in the creative industries, or the existence of clustering in the local area, on the outcome. A detailed exposition of the econometric approaches is provided in the Technical Appendix.

⁷⁹ Source: Spicer, A., Presence, S., & Frymus, A. (2022). GO WEST! 2 Bristol's Film and Television Industries. Bristol: UWE Bristol UWE (2022).

⁸⁰ The fraction of the impact of clustering in economic outcomes like employment or earnings that can be attributed to the BBC is not estimated directly from the econometric model but can be calculated in some instances indirectly.

Impact on employment

In analysis using the DCMS definition of creative industries, we find that a 1% increase in creative clustering is associated with a 1.7 percentage point (p.p) increase in creative industry employment, a 0.5 p.p increase in overall employment (of which 0.035 would be attributable to the BBC), and a 1.2 p.p decrease in non-creative employment. Using the alternative Nesta definition, we find a 1% increase in creative clustering is linked with a 1 p.p increase in creative industry employment, a 0.3 p.p increase in overall local employment level, and a 0.6 p.p decrease in non-creative employment. In Bristol that translates to approximately 457 jobs, and 418 jobs in Cardiff, in net terms⁸¹.

These results show that an increase/intensification in clustering of creative industries is strongly associated with a large increase in creative industry employment, which translates to an increase in the overall employment rate in the local economy. However, the boost in the creative sector is partially offset by a decrease in non-creative sector employment. This is indicative of workers switching to more productive, higher paid jobs in the creative sector.

Our modelling did, however, find that an individual in the creative industry is approximately 50% less likely to have taken an apprenticeship. This phenomena is industry-wide as opposed to BBC-specific, and suggests that investment in apprenticeships might be a way to bolster the strong impacts of creative clustering on localised labour market outcomes highlighted earlier on in this section. An additional way in which the BBC is helping facilitate the development of creative clusters, beyond attracting and crowding-in investment and the subsequent impact on employment, is by investing in the future creative industries workforce (particularly where skills gaps are present as described in Box 5). For instance, in the production of Line of Duty, for Season 6 over 70% of the total production budget was spent in Northern Ireland. As part of this, the BBC has invested in the skills and training of local production crew, spending around £50,000 per annum on trainees ranging from 'Costume' and 'Make Up' trainees to 'Camera' and 'Graphics' trainees.

⁸¹ The impact of the BBC on employment is captured by the "mediation effect" that comes via its impact on clustering. That means that this estimate of the impacts that is attributable to the BBC represents a lower-bound estimates (i.e. the impact of the BBC in employment is likely to be larger) since the BBC can also have a direct impact on employment (that is not being quantified) beyond the mediation effect.

Box 5 – BBC’s leading role in overcoming skills gaps in the UK creative sector

Access to skills is one of the well-identified key success factors of cluster development⁸². Co-location becomes economically advantageous for firms where they can benefit from a skilled labour pool within a local economy. Skills matter particularly for the creative industries because they are more innovative than other sectors, and innovation is underpinned by a wider set of competencies and entrepreneurship.

Yet, skills gaps are pervasive, a situation that may hinder the further development of clusters. Survey data indicate that as much as 42% of employers in the creative industries report not finding the skills they need – and the problem seems to become more accentuated for larger creative firms⁸³. The top three skills gaps are management, leadership, and project management, with a third of employers saying existing staff lack the skills needed to do their jobs. Training is also not up for the challenge: firms are most likely to fund training for experienced workers, rather than new entrants or apprentices, thus accentuating the skills gap challenge⁸⁴. Skills gaps are more pervasive outside of London and the south east of England⁸⁵, which further highlights the importance of investments of skills for levelling up.

The BBC is a key investor in skills for the industry, and it works with industry to fill the gap. Through its longstanding partnerships with educational institutions the BBC is supporting continuous development of human capital in the sector.

A prominent example is how the BBC works in partnership with National Film and Television School (NFTS) to upskill those already within the creative industries and those looking to switch careers and enter the industry. Investments in skills are significant across all the nations. Since opening in the autumn of 2021, NFTS Wales, based within BBC Cymru Central Square HQ in Cardiff, has trained 245 people seeking to enter or develop their skills in the creative sectors⁸⁶.

The BBC is a critical partner in the development of creative talent in Scotland, including working with Screen Scotland to deliver writer’s programmes and a partnership with the National Film and Television School to support emerging talent and skills in the sector. In Northern Ireland, the Aim High trainee scheme which creates 18 month placements for graduate entry into the broadcast production sector. To date 40 graduates have taken part in the scheme, following which they have taken up roles within the local creative sector.

The BBC has committed to providing twice as many apprenticeships (1000) per year across the UK by 2027/28⁸⁷ and it is innovating, in collaboration with the private sector, to better provide entryways into the industry. The Apprentices Hub in Birmingham is an innovation that aims to make apprenticeships more accessible to creative employers. The hub is a BBC led partnership with Google and local creative businesses. The hub will place Apprentices in a range of creative, gaming, cultural and digital businesses across the West Midlands. Full Fat TV, Optomen Television, Electric House, WMCA, Caters News, No Class Creations, and Top Banana are some of the first companies to take on apprentices from the hub. The commitment by the BBC is for 25 places in year 1, and scale to 200 places a year within 3 years.

Collaborations are also created with academic institutions. The BBC Studios Natural History Unit and University of the West of England have collaborated to develop and deliver a Masters courses in Wildlife Filmmaking and Documentary Production (the latter partnered with Plimsoll Productions). Around 159 students have graduated from the course with an employment rate of 97% in recent years, with students being offered employment ahead of graduation. Students are regularly shortlisted for the BAFTA Student Awards against a globally competitive field. In 2018 Lindsey Parietti won a student BAFTA for her powerful nature documentary Blood Island created during her time at UWE, later securing a commission on BBC2 in 2019.

These types of initiatives help support skills development across the sector in an inclusive way, which is crucial in supporting the industry’s ongoing productivity growth, whilst playing an active role in levelling-up.

⁸² It is well identified in academic literature (<https://hbr.org/1998/11/clusters-and-the-new-economics-of-competition>) and also has been highlighted by the Levelling Up white paper as one of the key drivers of cluster development.

⁸³ Source: Creative Industries Council Migration and Skills Survey: <https://cdn2.assets.servd.host/creative-pec/production/assets/publications/The-Migrant-and-Skills-Needs-of-Creative-Businesses-in-the-United-Kingdom-REPORT.pdf>

⁸⁴ One fourth of employers cite the use of freelancers as a key reason for a lack of training and development of staff.

⁸⁵ Skills gaps were most common amongst establishments in Yorkshire and the Humber (66 per cent of employers), followed by the North West (52 per cent), the North East (50 per cent) and the East of England (47 per cent). London and the South East lay below the Creative Industries average (40 per cent).

⁸⁶ With C4, S4C and Creative Wales the BBC is investing in specific industry schemes such as Factual Fast Track Wales to develop the next generation of senior factual leaders.

⁸⁷ As set out in the BBC’s Across the UK blueprint, available at: <http://downloads.bbc.co.uk/aboutthebbc/reports/reports/the-bbc-across-the-uk.pdf>

Impacts on Earnings

We find that an increase in the concentration of creative firms in an area increases opportunities for more highly paid work. A worker who is employed in the creative industries earns 9.4% more than a worker with a similar demographic and skill profile in another industry when modelled using the DCMS definition of creative industries, or 7.3% more when modelled using the Nesta definition. This is likely driven by the significant growth of the sector, as evidenced in Section 1 of this report, resulting in increasing demand for skilled creative labour.

We additionally find that creative clustering does not improve the wages of those who are already employed in the creative sector, nor those that are in other sectors. This logically follows the finding in Section 1 that creative sectors outperform the UK economy as a whole in terms of GVA, and so the growth of a more productive industry in a local area would be expected to generate higher paid jobs. This is supported by the aforementioned finding that where clustering exists workers are attracted from less productive, lower paid, jobs to more productive, higher paid jobs in the creative sector.

Figure 10 sets out educational attainment in the creative industries against the working population as a whole. Workers in the creative industries are approximately twice as likely to hold a degree than the national average, and are significantly less likely to have no qualifications⁸⁸.

Figure 10 – Educational attainment in the creative sector

Source: APS

Highest qualification	All Workers	Creative workers (Nesta)	Creative workers (DCMS)
Degree	33.84%	62.06%	62.75%
Higher Education (other)	9.19%	7.47%	7.97%
A Levels	22.66%	15.25%	14.46%
GCSE	19.40%	9.35%	9.21%
Other	7.98%	3.00%	2.94%
None	5.12%	1.88%	1.78%
Don't know	1.82%	0.99%	0.90%

Impact on working conditions

We find that workers in the DCMS definition of the creative sector perform 9.5% less unpaid overtime than equivalent employees in other sectors, rising to 11% using Nesta's definition of creative industries. We additionally find that a 1% increase in creative clustering is associated with a 13.9% reduction in unpaid overtime for creative employees using the DCMS definition, however we cannot replicate this result when using the narrower Nesta definition.

Whilst other quantitative metrics for working conditions are not available in the data, this finding represents strong suggestive evidence that creative clustering is associated with improvements in working conditions, in line with the previous evidence summarised in Section 3.1.

Taken together with the findings of Section 2 of this report that an increased BBC presence in an area increases creative clustering, and the above finding that clustering results in a significant increase in local creative employment, this implies that the spill-over impacts of an increased BBC presence in a local economy is likely to improve overall working conditions in the local economy.

Impact on social indicators

Whilst we find strong evidence of the local economic impacts of creative clustering, we do not find good quantitative evidence of social impacts of clustering. We used a similar econometric approach to that presented above to estimate the impacts of creative clustering on objective measures of physical and mental health, and subjective measures of wellbeing. We did not identify statistically significant impacts of creative clustering on these measures.

⁸⁸ For this reason it was particularly important to compare like-for-like workers in the regression analysis to isolate the impact of creative employment from higher average educational attainment.

There are documented examples that suggest that social inclusion could improve via the proliferation of non-profit enterprises, cultural institutions, arts values and local entertainment establishments. In addition to helping develop skills and jobs in an inclusive way, the BBC also supports content creation and production that suit local populations and can be a driving force of social cohesion (Box 6 describes how the BBC supports production in Welsh and Gaelic languages).

The very recent BBC Six Music Festival is an example of bringing a Network event to Wales and working in tandem with local agencies (Cardiff Council, Creative Wales and local venues) to deliver a great cultural moment for the BBC, the private sector and wider society.

Box 6 – BBC’s support of local culture

Supporting production and the Welsh language

The BBC has been investing in production in Wales since BBC Cymru Wales was established in 1964 and these investments have accelerated, particularly in Cardiff Bay, from the late 2000’s. With a long-term presence and important economic activity (over £200m in GVA and over 2000 jobs annually)⁸⁹, the BBC’s investment in content production in Wales is also supporting the development of a range of independent production companies. Alongside the English language content, in partnership with S4C, the BBC invests in high end drama in the Welsh Language. Co-commissioning with S4C has developed hits such as *Keeping Faith/Un Bore Mercher* (Vox Pictures), *Hidden/Craith* (Seven Screen), *Hinterland/Y Gwyll* (Fiction Factory) which are produced in both English and Welsh. In addition, large BBC network dramas such as *Doctor Who*, *Causality* and *His Dark Materials* have found a home in Cardiff.

Investment is set to continue under BBC’s Across the UK plans, while BBC investments (in both content and studio space) continue encouraging a range of indies to develop successful production sites in Wales. These include *Severn Screen*, *Little Door* and *Bad Wolf* (which opened its own studios in 2017), who produce content, not just for the BBC, but a range of Broadcasters and VOD services.

Supporting production and the Gaelic language and culture

Through MG Alba and BBC Alba the BBC plays a vital role in growing the Gaelic Arts and Cultural sector in Scotland via funding, commissioning and developing production, skills and talent. Furthermore, a series of community screenings create direct contact with communities. From headquarters in Stornoway, MG ALBA oversees the day-to-day operations of BBC ALBA including post-production support, scheduling and quality control.

The creation of new businesses via funding, commissioning and mentoring is certainly an economic benefit for Scotland⁹⁰. Furthermore, the local social impacts of Gaelic content can also translate into economic benefits. Previous studies have suggested that the Gaelic Arts and Cultural sector has played a key role in fostering positive attitudes to the language from the non-Gaelic speaking community, and previous evidence has also indicated that the sector – in particular, its broadcasting and events elements – have been key factors in Gaelic employment and Gaelic economic impact in the Glasgow area⁹¹.

Supporting production and the Irish and Ulster Scots languages and culture

BBC NI has been working with Northern Ireland Screen and its Irish and Ulster-Scots Broadcast Funds to develop the range, impact and benefits of minority language programming. This collaboration has delivered innovative, high quality output across different programme genres. It has also facilitated skills development in this area. Such work has significant cultural value in addition to the opportunities that it has created for the production sector. And it complements the role that the BBC and its funding partners play in supporting the arts and cultural life more generally, including with the Ulster Orchestra.

⁸⁹ Source: An Assessment of the Economic Impact of the BBC, A report for the BBC for Financial Year 2019/20. KPMG 2021.

⁹⁰ BBC ALBA supports independent TV companies such as *Bees Nees*, *Corcadal*, *Mast-Àrd* and *Caledonia*, based in Glasgow, through mentoring delivered with FOCUS (a Scottish Enterprise/Screen Scotland joint initiative). Several of these companies have received commissions and taken part in further development initiatives as a result of this partnership.

⁹¹ See for instance Chalmers D, & Sproull A: *The Demand for Gaelic Artistic and Cultural Products and Services: Patterns and Impacts* GCU 1996; Chalmers D & Danson M. *The Economic Impact of Gaelic Arts and Culture within Glasgow*. Glasgow City Council. 2009.

In addition the BBC often uses its local hubs and national reach to deliver cultural and outreach activities that have social benefits, irrespective of the presence of a creative cluster. The BBC has committed to double the number of organisations it works with to deliver outreach with an ambition to reach up to 1 million children by 2027/28. The BBC partnered with Coventry to shine a light on the UK City of Culture 2021 which kicked off in the midst of the pandemic. BBC coverage meant the opening event could be shared with audiences across the UK and globally. The opening was featured on a number of BBC programmes including The One Show, BBC News at Ten, BBC World News, and across local radio and regional TV programmes. Other highlights include three bespoke BBC Arts documentaries, co-productions involving Coventry City of Culture Trust, and Coventry hosted Radio 1's Big Weekend in May 2022.

The BBC's education offer for school age children through BBC Bitesize and BBC Teach is a national example of the BBC's impact on educational outcomes beyond the creative sector. But the BBC leverages its network to deliver local educational opportunities too. To mark the BBC's 100th year, in early 2022 it launched Share Your Story, an ambitious storytelling initiative across 700 UK schools, to empower year 7-9 students with the confidence and creative tools to tell their life story. Delivered via a suite of resources on BBC Teach with training led by partners, National Literacy Trust, Voice 21 and the BFI, Phase 1 of Share Your Story ran from February – March 2022, reaching 60,000 students, with a goal to engage with 400,000 students and 4,000 teachers face-to-face by the end of 2022. The BBC has also delivered five local 'hubs' for its Tiny Happy People service in Northern Ireland, Greater Manchester, Cornwall and Scotland. Working with local government, NHS and charities the service arms parents with the knowledge to support their child's communication skills through simple activities, interaction and play.

Such wider social impacts have not been quantified in this study due to data limitations but it is a question that can be further explored in future research – Section 4.2 concludes with a few areas for further future research.



4

Policy implications



4.1 Local development and levelling up

The level of productivity in the UK has lagged behind other advanced economies, and it is well known that there are wide regional disparities in productivity and prosperity within the country⁹². The reasons for these regional disparities in economic development are multiple and complex, ranging from access to skills to transport connectivity, but are also shaped by historical reasons. And some of the factors can be self-reinforcing – for instance, in places where fewer availability of jobs limits opportunities for skills development, this then further damages productivity and job creation (thus leading some regions or local economies to be trapped in a low-skill spiral).

Prosperous regions and cities tend to concentrate high-value and innovative industries. Section 1 demonstrates that creative employment is still highly concentrated in London and the South East despite some more recent increase in the diffusion of creative clusters across the UK. Nesta also uses location quotients (relative measures of creative job distribution) to show that both London and the South East have a greater proportion of employment in creative industries compared to the region's distribution of employment⁹³.

International evidence shows that the development of clusters can also generate large employment effects in formerly depressed regions, thus helping close gaps with more prosperous regions⁹⁴. **How can the expansion of creative clusters help bring economic activity to other regions and thus reduce such disparities in the UK?**

The evidence presented in Sections 1 and 3 of this report would suggest that the development of creative clusters is part of a solution to these regional disparities. The development of creative clusters leads to higher employment and wages, which is likely linked to higher productivity and can lead to higher living standards in local economies⁹⁵. This aligns with the government's 'levelling-up' objective of reducing regional disparities in income and productivity by improving the distribution of work opportunities across the UK. Qualitative evidence from other studies suggest that benefits could be wide-ranging and extend beyond direct employment gains, covering a reinvigorated sector of tourism (Box 7)⁹⁶ and the attraction of young, talented people with new ideas. A few real examples suggest that social inclusion could also improve via the proliferation of non-profit enterprises, cultural institutions, arts values and local entertainment establishments⁹⁷.



⁹² For instance, at over £50 per hour, the productivity of West London is more than twice that of Cornwall (at £20 per hour) – source: Jones and Zymek, UK Regional Productivity Differences: An Evidence Review, 2020.

⁹³ Nesta, Regional Inequalities in the UK's Creative Industries, 2019.

⁹⁴ Muro et al (2011) demonstrates that, in the US, as many as 62,000 jobs would be created by cluster development. Source: Muro, Fikri, How Regional Industry Clusters Can Add Jobs, Bolster Entrepreneurship, and Spark Innovation, 2011

⁹⁵ The Work Foundation argues that these benefits at the level of the local economy are driven by the sharing of production facilities, matching job seekers to employers and learning through the sharing of information within clusters.

⁹⁶ The UK economy gained roughly £38 million in expenditure from international visitors engaging solely in creative industries in 2011 (source: Cebr, The contribution of the arts and culture to the national economy, 2013). Tourism is important in job creation: the WTTC forecasts that tourism will generate approximately 700,000 UK jobs over the next decade, increasing local employment opportunities and productivity (source: WTTC, Travel and Tourism Report, 2022).

⁹⁷ There is evidence that shows positive effects in small scale and neighbourhood projects that are designed to ameliorate social tensions – improving health and welfare of people. Source: 'Creative Clusters, Social Inclusion, and Sustainability: The Case of Hackney Wick and Fish Island'.

Box 7 – Boost to Tourism through creative scenes⁹⁸

Film and TV have long been a window on the world for those watching at home. As a result impacts can go beyond those resulting from the filming or being based in an area. Increasingly, hit shows can have a positive impact on local economies where they were filmed. In recent years, three BBC shows have had a significant impact on their local economies:

- Poldark (which aired between 2015 and 2019) has spawned a small tourism industry, with Visit Cornwall promoting Poldark tourism, and a range of companies providing tours. Reports indicate that more than 1 in 10 visitors cited the programme as a reason for visiting the county.
- Shortly after Gentleman Jack first aired, according to the local council, visits to Anne Lister’s historic home, Shibden Hall, have trebled; local businesses are reporting increased income; and millions of pounds are being brought into the local economy. With local councillors stating that “[Gentlemen Jack]has secured our place on the map as a major cultural, LGBTQ and heritage destination”.
- Similarly Peaky Blinders, although initially not filmed in Birmingham, has been attributed to a tourist boom in the region. With rising visitor numbers and activities related to the show, including a dedicated Peaky Blinders festival held for the first time in 2019. Visitor numbers in Birmingham increased by 26% between 2013 and 2018.

Two factors can make the creative industries a more effective engine of local economic development and levelling up:

1. The innovative nature of the creative industries.
2. The role of the BBC as an anchor institution.

Creative industries contributions to the wider economy are due to their capacity to foster innovations that cut across other sectors in local economies. Creative businesses in sectors such as advertising, architecture and software are heavily engaged in business-to-business activity and therefore are a focal point for creativity, stimulating business innovation in the wider economy.

This means that innovations tend to be more ‘democratised’, thus benefitting wider segments of society. Emerging evidence suggests (though not conclusively) that creative industries would expand alongside the evolution of technology. With use cases such as the use of artificial intelligence for marketing and others⁹⁹, the mix of creative and tech enterprises are creating a ‘createch’ in some locations¹⁰⁰. Furthermore, as technology automates more and more jobs, particularly in manual and low-skill jobs, those sectors based on human ingenuity and creativity are those that will more likely thrive.

⁹⁸ Sources: <https://www.visitcornwall.com/poldark>; <https://businesscornwall.co.uk/news-by-industry/tourism-sector-business-news-cornwall/2019/05/cornwall-hails-poldark-effect/>; <https://www.cornwalllive.com/news/celebs-tv/poldark-still-bring-people-cornwall-1480935>; <https://news.calderdale.gov.uk/the-gentleman-jack-effect/>; <https://www.bbc.co.uk/mediacentre/articles/2022/peaky-blinders-birmingham-legacy>

⁹⁹ There are greater commercial uses of creative content as technology develops, for example, the use of AI marketing by respondents to a survey saw the revenues of 40% of among them to increase by over 5%. Source: McKinsey, Global AI Survey: AI proves its worth, but few scale impact, 2019.

¹⁰⁰ More examples on the emergence of createch can be found on: <https://cdn2.assets-servd.host/creative-pec/production/assets/publications/PEC-An-analysis-of-Creatch-RD-business-activity-in-the-UK-v3.pdf>

Together, this means that the creative sector is well positioned for the future. The UK is set to become Europe's largest entertainment and media economy, with revenue predicted to grow at 4% per annum¹⁰⁰. The HM Government Levelling Up White Paper sets out economic clustering as one of the key strategies to promote regional growth, suggesting the geographical presence of anchor organisations is important in catalysing economic clusters, whereby high-skill, high-value-add, industries co-locate to take advantage of local labour markets and supply chains. The evidence presented in this study suggests that the BBC plays that anchoring role in the creative sector across many clusters in the UK, not just media specialised clusters. The presence of the BBC in local economies strengthens the creative industries, and without the BBC's strong presence in these areas, the development of clusters could be hampered in the following ways:

- **Insufficient funding and investments**¹⁰¹: businesses in the creative sector need large investments whose returns only materialise over the long term, which complicates access to finance¹⁰² or disincentives investment altogether.
- **More limited innovation**: this can be the result of more limited knowledge transfers and also potentially harmed by reduced competition¹⁰³.
- **A smaller talent pool**¹⁰⁴: larger common labour market pools enable greater employment growth¹⁰⁵.
- **More limited economies of scale**: this may happen when there are less networking opportunities within clusters thus reducing the sharing of production costs and further reducing the number of functioning institutions making clustering less effective¹⁰⁶.

¹⁰⁰ PwC Entertainment and Media Outlook 2022.

¹⁰¹ The Department of Trade and Industry explains seven critical factors of successful cluster development, all of which were observed in successful clusters. Source: Department of Trade and Industry, A Practical Guide to Cluster Development, 2004.

¹⁰² The DTI explains that sources of funding are paramount to the success of cluster formation (Source: <https://bluetongue1.files.wordpress.com/2008/04/2004-a-practical-guide-to-cluster-development-uk-dti.pdf>)

¹⁰³ HBR explains that from competition arising within clusters comes a different type of comparative advantage, one that emphasises more productive use of inputs thus requiring innovation. Source: Porter, M via HBR, Clusters and the New Economics of Competition, 1998.

¹⁰⁴ A possible reduction in institutions; the arts will possibly see a reduction in available courses over the next few years due to funding cuts thus presenting less opportunities for enhancing workplace skills eventually leading to a reduction in creative productivity Source: Creative Industries Federation and Nesta, Creativity and the Future of Work, 2018.

¹⁰⁵ Industries in clusters experience greater employment and wage growth likewise for firms in related clusters in the same or adjacent regions. Employment growth at the regional cluster level declines as unrelated industries do not reap the same benefits, they are exposed to a smaller labour pool. Source: Delgado et al, Clusters, convergence, and economic performance, 2011.

¹⁰⁶ Innovating in the use of the latest technologies such as 5G for proof of concept trials such as 5GRuralFirst. As part of a consortium of over 30 organisations, the BBC explored the potential new approaches to the deployment of connectivity in rural areas, which can often suffer from low and unstable bandwidth on both fixed and mobile. Through the use of 5G as a live broadcast medium.

Government and other local stakeholders can work with the BBC to create more favourable conditions for cluster development. The evidence of section 2 shows that the BBC crowds in investment, but not all businesses find it easy to operate successfully in the creative sector – which could limit future cluster development. One of the difficulties for instance, is that intangible creative outputs may be easy to scale, but that same intangibility makes it harder for firms to appropriate the benefits and raise finance, thereby constraining the sector's productivity growth¹⁰⁷.

Policies can help facilitate finance and other enablers of growth, and can ensure commonalities and synergies across the diverse creative enterprises operating in the cluster¹⁰⁸. Policies can also try to integrate the Arts with other disciplines (e.g. STEM) since synergies have been found to be important in emerging research¹⁰⁹.

Policies also need to facilitate the spread of benefits beyond the boundaries of creative clusters. Evidence shows that if a local region has creative specialisation it increases the likelihood by 80% that neighbouring regions will specialise in that sub-sector too¹¹⁰. This suggests that the development of creative clusters does not create 'zero-sum games' where regions adjacent to the clusters lose out (e.g. one argument often used is that talented people leave for better opportunities). Growth in creative industries in local economies where the BBC operates can be in part attributed to BBC's activities. However, there are areas where the creative industries have got continually stronger without the need for a direct injection from the BBC. For example, Cookstown and Magherafelt have seen year on year growth in their creative clustering despite the BBC having no physical presence within the area and minimal procurement spend over the period. One feature is that they are close to the West of Belfast, which has a large creative cluster and longstanding BBC activity. Surrounding areas benefit from some form of BBC investment and creative cluster growth can spill-over TTWAs.

¹⁰⁷ Nesta, J.M, Garcia, J. Klinger and K. Stathoulopoulo "Creative nation: How the creative industries are powering the UK's nations and regions".

¹⁰⁸ The Work Foundation explains how overspecialisation can be detrimental to clusters as no overlap between institutions would reduce thus limiting the benefits of sharing information and facilities as this is dependent on mutual specialities. Over-specialisation within firms which is detrimental to cluster formation as a robust network with commonalities is essential to cluster success (also it limits associated cost reduction) Source: The Work Foundation, Creative Clusters and the Changing Economy: A Review for Pinewood Studios, 2011

¹⁰⁹ The separation of the arts and STEM can be harmful to both creative and sector growth, to ensure the success of any policies, the arts should be considered with STEM as the overlap between the sectors can result in as many as 616 thousand jobs. For instance, the development of technology and the cultural significance of video games leads to other applications of technology and creativity together. Nesta and Creative Industries Federation highlight the significance of placing emphasis on the arts in collaboration with STEM to reap the maximum benefits from the creative industry. Source: CIF and NESTA, Creativity and the Future of Work, 2018

¹¹⁰ Nesta, J.M, Garcia, J. Klinger and K. Stathoulopoulo "Creative nation: How the creative industries are powering the UK.

4.2 The future of BBC's activities

The BBC's Public Purpose 4 is "To reflect, represent and serve the diverse communities of all of the United Kingdom's nations and regions and, in doing so, support the creative economy across the United Kingdom."

Additionally, the Across the UK plan expresses aims to grow closer to UK audiences and stimulate the UK's creative sector. The government's Levelling Up White Paper expresses objectives of boosting productivity, pay and jobs through sector growth, aligning with the BBC's Across the UK plans.

The findings of the study give directions about how the BBC's future local activity can continue growing effectively:

Pursue transformational initiatives: Our findings imply that the BBC should pursue large targeted investments in strategic locations that will create maximum impact. This is supported by the BBC's ability to enact transformational change through its investment and the subsequent development of creative clusters. A prime example is the creation of Media City in Salford, which has had a transformative impact on the local community by creating new opportunities that were not available before. While the BBC will not be able to replicate Salford everywhere, it should be wary of spreading its investments too thinly as this will lessen its impact.

Invest in local talent: The BBC works with local businesses and talent (for instance, in the West Midlands), these initiatives can build the local talent pool that will allow local creative clusters to continue growing. One example of the indirect impacts of BBC's activities is the BBC Academy's new Apprentice Hub, which arranges placements for aspiring creatives with local businesses – in areas as diverse as broadcast production, content creation, and digital marketing.

Collaborate with diverse stakeholders: Though not quantified in this study, qualitative evidence suggests that the brand of the BBC convenes players from across the creative sector and beyond to deliver maximum economic and social impact through partnerships, research and knowledge sharing and other business practices. For instance, BBC R&D works in partnership on large-scale research projects with multiple academic, commercial and local government partners. Through these it has helped secure over £64m in research funding in a diverse range of areas from connectivity and 5G use in rural areas to questions of digital citizenship.

To this end, through its Across the UK plan, the BBC has committed to investing at least an additional £700m outside of London and the South East by 2027/28, generating additional economic benefits to those parts of the UK of at least £850m¹¹¹. Using the econometric findings of this report, we calculate that the increased creative clustering generated by these plans will result in approximately 4,750 new creative firms and 45,000 additional jobs outside London and the South East by 2027/28. Birmingham is a region that is a particular focus for the BBC's Across the UK plans as set out in Box 8.

A final recommendation is to **keep social value in mind:** the BBC will maximise impact by combining activities and investments for cluster development with social programmes. Though wider social impacts are not quantified in this study, there are documented examples that suggest that social inclusion could also improve via the proliferation of non-profit enterprises, cultural institutions, arts values and local entertainment establishments. In addition to helping develop skills and jobs in an inclusive way, the BBC also supports content creation and production that suit local population and can be a driving force of social cohesion.

¹¹¹ The BBC Across the UK: <http://downloads.bbc.co.uk/aboutthebbc/reports/reports/the-bbc-across-the-uk.pdf>

Box 8 – BBC investment in Digbeth and the West Midlands

In March 2021, the BBC announced a 5-year agreement with Create Central and the West Midlands Combined Authority to build Birmingham's strength in TV formats, with more primetime brands to sit alongside Great British Menu.

Since then, the BBC has announced that four Masterchef titles would move to Digbeth from 2024 and have commissioned a range of Drama titles as well as further commissions from Children's and BBC Three including from independent production companies Full Fat TV (Fresh Cops); Acclaimed (Mother Truckers) and Common Story (Filthy Business).

Along with this boost to commissioning the BBC's Across the UK plans include:

- the BBC moving additional network news teams into The Mailbox as the BBC's regional HQ in the city – this includes the Data Analysis team as well as Asian Network News and Newsbeat (from November 2022).
- The Asian Network will move fully to Birmingham by 2024, as well as further output from BBC 1XTRA.
- An apprentice training Hub, launched in January 2022 in partnership with Google and a range of creative SMEs in the region. The scheme hopes to grow from 50 placements in the first year to 200pa within 3 years.
- Supporting trainee placements on regional productions, as well as a specific talent initiative (where it begins) to grow talent pathways for BBC Asian Network.

- The BBC has also invested in regional small indies across radio and TV through its small indie funds. This includes audio always for radio and portopia and cornered tiger for TV.

Perhaps the most significant enabler of clustering in the long term for the region is the BBC's commitment to Digbeth, currently a large brownfield neighbourhood adjacent to the city centre and the new High Speed 2 terminal. The site has been earmarked as a future creative quarter for the city and region in the City Masterplan for Birmingham.

The BBC's commitment to move Masterchef to Digbeth from 2024 is enabling the development of the Digbeth Loc studio site in partnership with Banijay/Kudos as suppliers but also public bodies such as Homes England who own the land where the studio will be built.

In July 2022, the BBC announced that it will relocate its regional HQ from the Mailbox to the former Typhoo tea factory in Digbeth from 2026. This will involve a major economic injection into the regeneration of a significant creative quarter for the city, setting new standards for the sustainable regeneration of former industrial sites. As first mover and anchor tenant for the Digbeth neighbourhood, and with a major HQ within 5 mins walk of its new production hub in the region at Digbeth Loc, the BBC is expected to stimulate a significant creative cluster in the region.

Monitoring investment and performance over time

The activities and investments of the BBC will only become more effective by measuring and monitoring their impacts on clusters and wider communities, which enables more targeted action. The BBC will need to identify key metrics to monitor the impact and progress of the Across the UK ('ATUK') strategy¹¹², for instance, by building dashboards with regular data updates over time. Such dashboards will need to cover traditional local economic outcomes like employment and business creation, and also innovate to build indicators that measure social value¹¹³.

To maximise the usefulness of data in supporting the development of creative clusters, the BBC needs to define clearly what ATUK main objectives are (e.g. maximise investments, social impacts, etc.), what kind of information is the most useful to build key performance indicators and define what kind of decisions it plans to make with the information.

The modelling tools for tracking impacts will need to contain some basic features:

- A model that is flexible enough to be adaptable to future investment strategies.
- A toolkit that 'scales' to a specific location.
- Optimise the use of public sources of data.

With these features, the monitoring tools (dashboards) should provide various insights, for instance, showing impacts of different types of investments or initiatives and even providing insights into more strategic questions about the future of the BBC.

Future research

The impacts of the BBC on creative clusters can have several ramifications, but not all were quantified and assessed in this study given data constraints. We assessed several social impacts however the quantitative evidence was less clear. This is likely in part because social impacts would be expected to be accrued more locally than the travel to work areas on which the research in this report focuses. We recommend that there is scope for further, more spatially targeted, research into the social impacts of creative clustering.

The research presented in this report is strongly indicative that the BBC's pre-existing and planned activities are aligned with Theme 2 of the Cabinet office social value model: Tackling inequality¹¹⁴. However, we highlight that there is scope for further research into the BBC's performance in terms of the model's remaining themes:

- Contribution to Covid-19 recovery
- Fighting climate change
- Equal opportunity
- Wellbeing

Further research, along with the findings of this study, provide the elements to start building and reshaping the impact frameworks and tools that the BBC needs to maximise the value it brings to creative industries, to the economy, and to society in general.

¹¹² See BBC blueprint for the future: <https://www.bbc.co.uk/mediacentre/2021/across-the-uk>

¹¹³ Lord Parkinson of Whitley Bay has reiterated the government's commitment to assessing the BBC's impact on regional news groups, telling the upper house: 'The Charter mid-term review will look at the BBC's market impact, evaluating how the BBC and Ofcom assess the market impact and public value of the BBC in an evolving marketplace and how that relates to the wider UK media ecology, including with regard to commercial radio and local news sectors and other content makers and distributors.'; <http://www.newsmediauk.org/Latest/meredith-bbc-digital-presence-presents-serious-challenge-to-commercial-sector>

¹¹⁴ The Cabinet office: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/940826/Social-Value-Model-Edn-1.1-3-Dec-20.pdf

Annex

– Creative sector local profiles



This Annex looks in more detail at the composition of creative industries and clusters in a selection of local economies. The cities/regions covered are:

- Birmingham
- Bristol
- Cardiff
- Glasgow
- Newcastle
- Belfast and Northern Ireland

*Belfast is included in less granular detail as there is no comparable employment data for Northern Ireland

Each city profile presents data on creative enterprises and a breakdown of employment by subsector within the creative industries.

Travel to work area creative cluster profile: Birmingham

Creative employees: **29k**

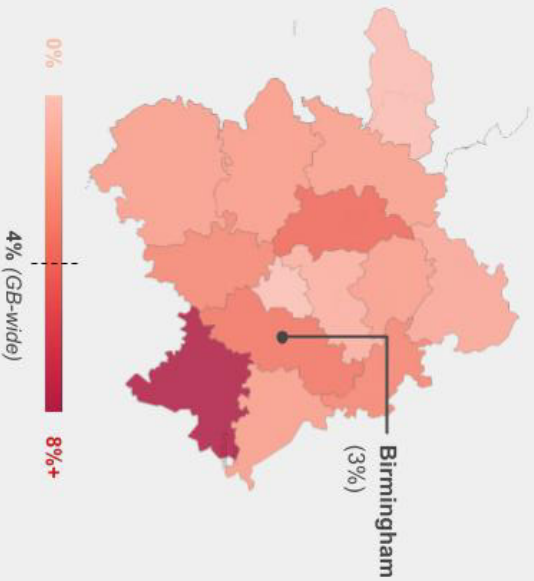
Creative companies: **11k**

Share of creative companies: **9%**

Employment location quotient: **0.80**

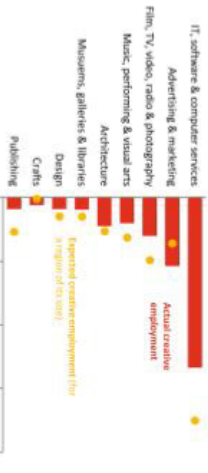
BBC employment as a % of total creative employment: **2.3%**

Creative share of employment

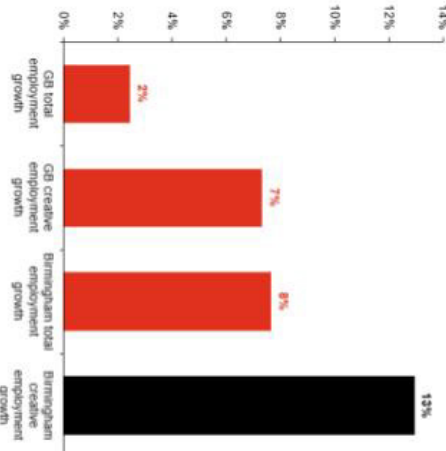


- Birmingham's has a thriving creative sector, which is growing at a faster pace (13% growth since 2015) than its non-creative sector (8%) and is out-growing the creative & non-creative sectors in the rest of GB (7% & 2%, respectively)
- Creative businesses are distributed across the Greater Birmingham region - but most of the film & television production activity is concentrated within the city
- Particular strengths include 'Film, TV, video, radio and photography' and 'Advertising and marketing'
- The BBC Asian Network and Radio 1 Newsbeat are joining the BBC Three commissioning teams in Birmingham by the end of 2022, preparing Birmingham to become the home of BBC's youth content
- BBC partnered with Shine TV to relocate MasterChef to Birmingham, acting as a catalyst for Birmingham's creative regeneration
- BBC spearheads the newly established Apprentice Hub in Birmingham with Google and local creative businesses, looking to scale to 200 apprentices a year within 3 years

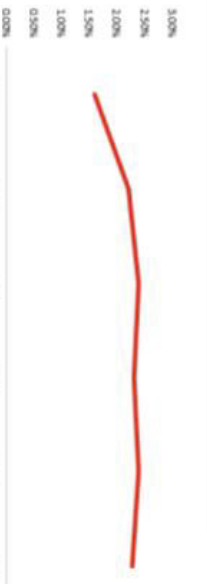
Birmingham creative employment, 2020, by sub-sector



Growth in employment (%), 2015 to 2020



Evolution in BBC creative employment (%), 2015 to 2020

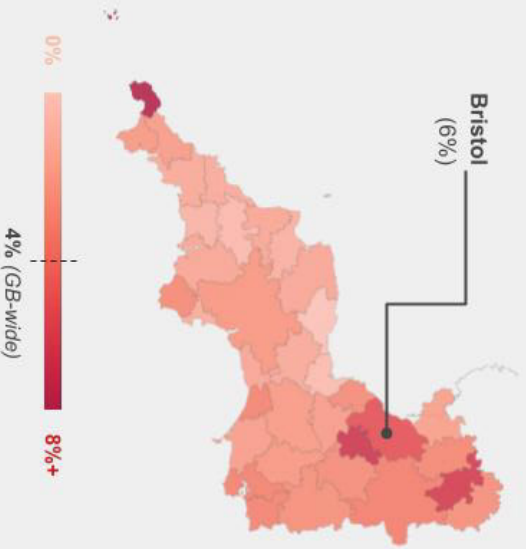


Sources: PwC analysis, ONS, BOP Consulting, Companies House
 Notes: 'Expected creative employment' is defined as the number of employees per sub-sector if the region matched GB-wide performance

Travel to work area creative cluster profile: Bristol

Creative employees:	29k
Creative companies:	8k
Share of creative companies:	14%
Employment location quotient:	1.65
BBC employment as a % of total creative employment:	1.0%

Creative share of employment

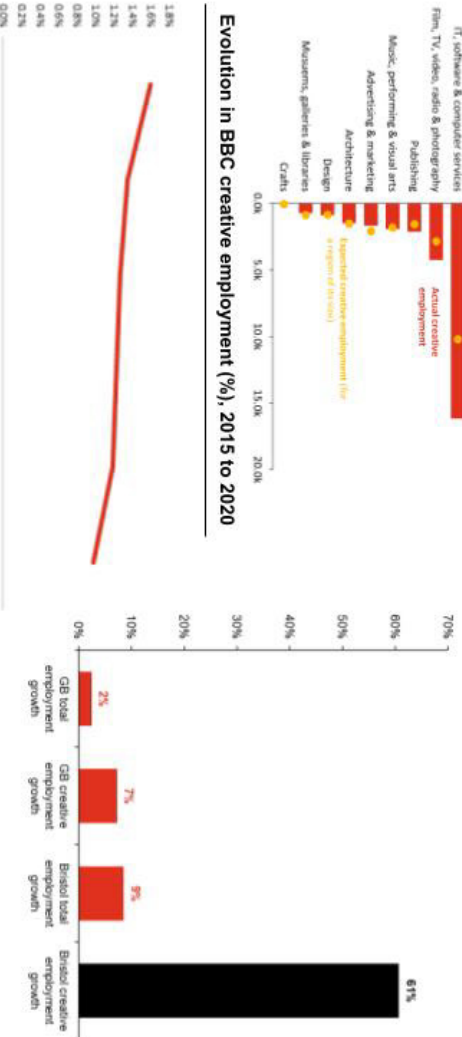


- Bristol is a vibrant creative cluster that has undergone huge growth in recent years, with employment up 61% from 2015-2020
- The cluster is typified by sub-sectors such as 'IT, software and computer services' and 'Film, TV, video, radio and photography'
- Bristol also boasts a huge 14% of companies being listed as creative
- The National History Unit Studios based in Bristol has now become the world's largest wildlife production unit, featuring world renown shows such as Blue Planet and Planet Earth
- BBC is a pivotal medium for creative growth within Bristol, as many natural history companies within the area has been established by former BBC employees which have assisted in developing the cluster
- BBC are leading by example in the drive to promote and encourage ESG through innovative green produced shows, relocation of staff to areas promoting diversity and investment in supply of talent.

Bristol creative employment, 2020, by sub-sector



Growth in employment (%), 2015 to 2020

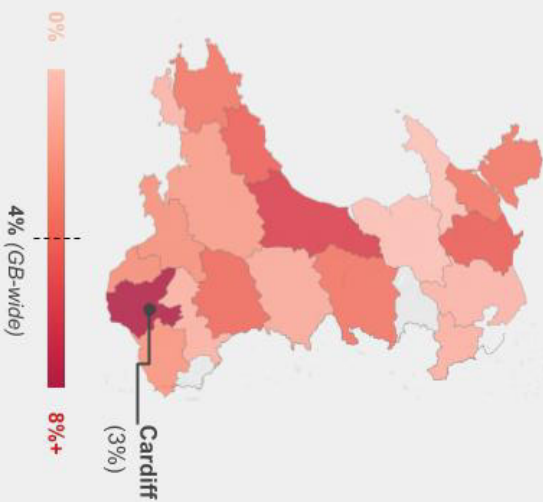


Sources: PwC analysis, ONS, BOP Consulting, Companies House
 Notes: 'Expected creative employment' is defined as the number of employees per sub-sector if the region matched GB-wide performance

Travel to work area creative cluster profile: Cardiff

Creative employees:	11k
Creative companies:	5k
Share of creative companies:	12%
Employment location quotient:	0.96
BBC employment as a % of total creative employment:	11.1%

Creative share of employment

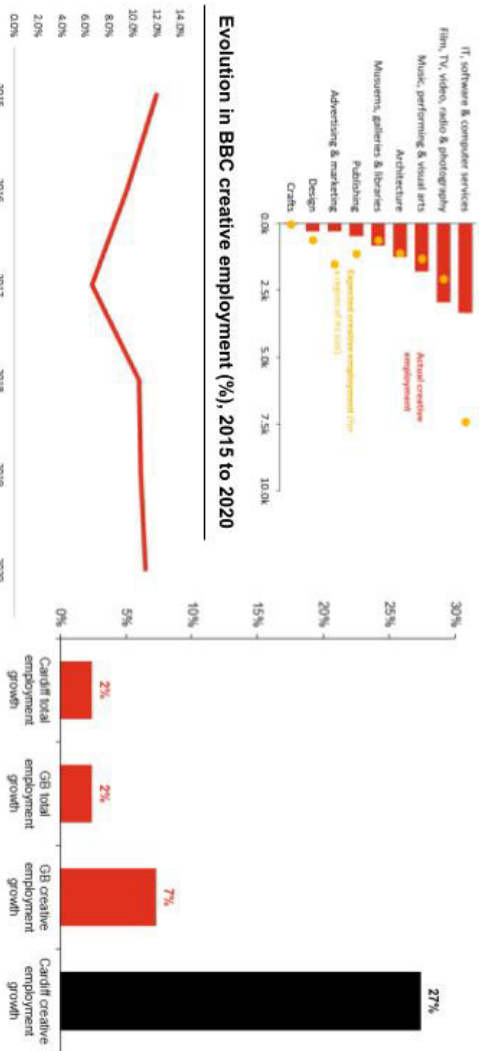


- Cardiff is another fast-growing creative hub and has seen its creative industry employment grow by 27% from 2015-2020
- Cardiff also boasts a large proportion of creative firms at 12%
- The BBC has been at the forefront of this growth since 2011 after investing a huge amount to create 170,000 square feet of drama studios at Roath Lock, making it the largest drama studios in the UK
- Famous shows such as Doctor Who and Casualty were filmed and produced at Roath Lock
- BBC have recently opened Cardiff Central Square, acting as a hub for wider creative sector, looking to create almost 2000 jobs in the area
- BBC continue to engage in productive conversation with key stakeholders in the area such as Cardiff Council and Creative Wales to bring about events such as the BBC Six Music Festival
- The BBC invests in creating a thriving Welsh language media economy through providing tens of million pounds of annual content, independent access to BBC iPlayer, and investment for training schemes

Cardiff creative employment, 2020, by sub-sector



Growth in employment (%), 2015 to 2020

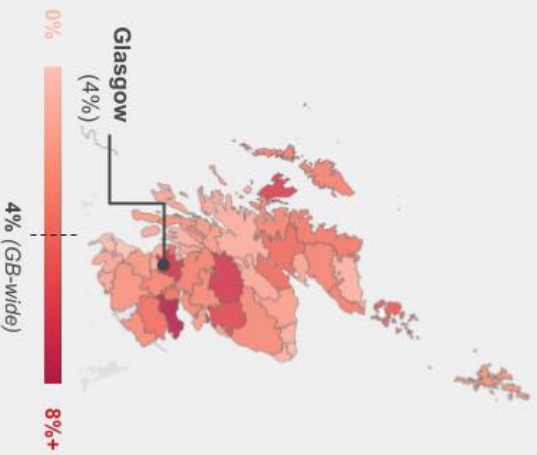


Sources: PwC analysis, ONS, BOP Consulting, Companies House
 Notes: 'Expected creative employment' is defined as the number of employees per sub-sector if the region matched GB-wide performance

Travel to work area creative cluster profile: Glasgow

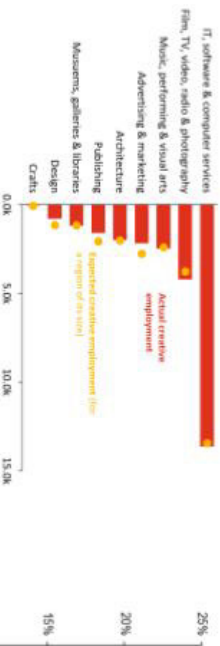
Creative employees:	28k
Creative companies:	7k
Share of creative companies:	10%
Employment location quotient:	1.20
BBC employment as a % of total creative employment:	4.2%

Creative share of employment

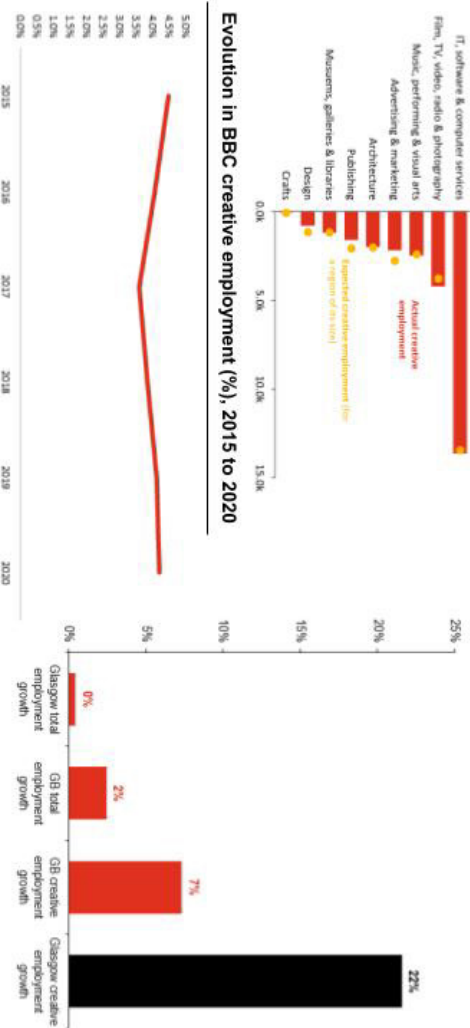


- Glasgow is also a fast-growing and vibrant cultural centre with 22% employment growth from 2015-2020
- Glasgow is also home to more than 100 cultural organisations and five of Scotland's six internationally renowned performing arts companies including the BBC Scottish Symphony Orchestra
- BBC creates streams of media to allow the Gaelic world to become much more accessible and present within communities in Glasgow, charged by a partnership with MG ALBA
- BBC's operations include elements of talent development, evidently showcased by working with Glasgow-based companies such as training provider TRC, on a national scale
- BBC have 60 staff based in Glasgow who retain some level of proficiency in Gaelic, highlighting their commitment internally to promote development of the language in the region, and to be a leader within the community through setting examples

Glasgow creative employment, 2020, by sub-sector



Growth in employment (%), 2015 to 2020

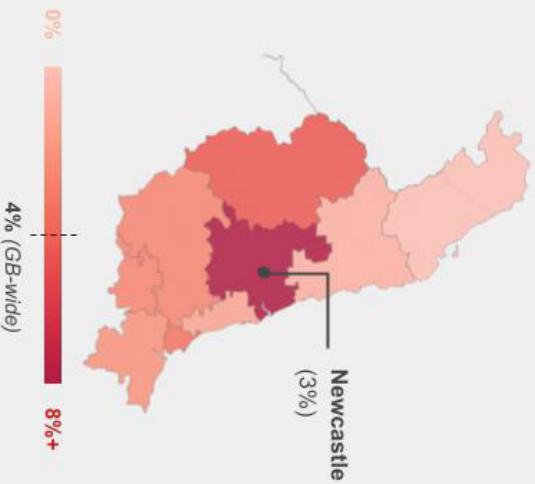


Sources: PwC analysis, ONS, BOP Consulting, Companies House
 Notes: 'Expected creative employment' is defined as the number of employees per sub-sector if the region matched GB-wide performance

Travel to work area creative cluster profile: Newcastle

Creative employees:	17k
Creative companies:	4k
Share of creative companies:	10%
Employment location quotient:	1.00
BBC employment as a % of total creative employment:	1.1%

Creative share of employment

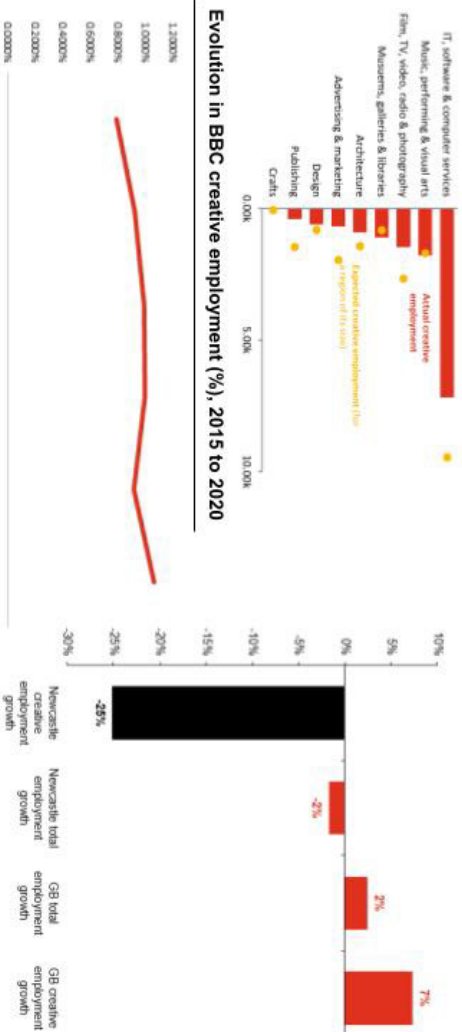


- Newcastle has been a UK creative powerhouse, however it saw a large decline in creative industry employment from 2015-2020
- The BBC has however responded to this and in September 2021 committed to spending £25m over the next five years in the North East
- The BBC is committing to creating a new creative hub in Newcastle which will generate 70 digital jobs for the community
- This year in May, Newcastle became the first BBC City of Comedy, hosting a festival for independent producers and those within comedy to give opportunities for breakthrough and further development
- BBC continues to focus on building positive relationships with other companies, establishing a scheme to pair new independent companies with seasoned companies, promoting learning and growth within the region and industry

Newcastle creative employment, 2020, by sub-sector



Growth in employment (%), 2015 to 2020



Sources: PwC analysis, ONS, BOP Consulting, Companies House
 Notes: "Expected creative employment" is defined as the number of employees per sub-sector if the region matched GB-wide performance

Creative cluster profile: Belfast and Northern Ireland

Belfast (TTWA)

Creative companies:

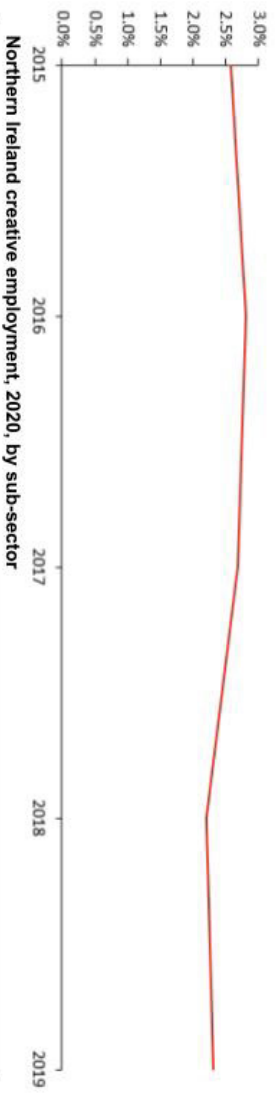
3.7k

Share of creative companies:

11%

- Belfast has a thriving creative sector spearheaded by a wide array of companies.
- This is evidenced by the fact that 11% of companies in Belfast are classified as creative.
- Belfast plays host to multiple major TV and film productions namely Game of Thrones, The Fall and Krypton.
- Belfast also attracts wide investment, for example over £25 million is being invested through the Region City Deal in Studio Ulster. This is being developed by Ulster University in partnership with Belfast Harbour and supported by Northern Ireland Screen.
- This is supported by a large creative sector in Northern Ireland, in which 3% of all employees work in creative industries.

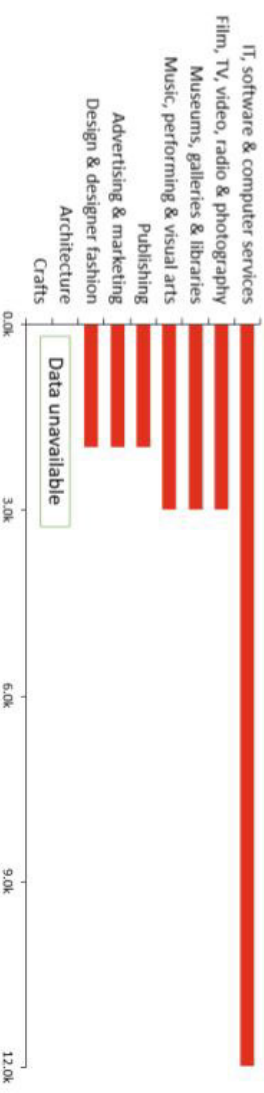
Evolution in BBC creative employment in Belfast (%), 2015 to 2019



Northern Ireland

Northern Ireland overall creative industry employment

3%



Sources: PwC analysis, ONS, BOP Consulting, Companies House
 Notes: "Expanded creative employment" is defined as the number of employees per sub-sector if the region matched GB-wide performance

Technical Appendix



A.1 Definition of creative industries

The Creative Industries were defined in the Government's 2001 Creative Industries Mapping Document as "those industries which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property". This definition is still used by the government today. A full breakdown of creative sub-sectors and corresponding sic codes can be found below:

Sub-sector	SIC	Description
Advertising and marketing	70.21	Public relations and communication activities
	73.11	Advertising agencies
	73.12	Media representation
Architecture	71.11	Architectural activities
Crafts	32.12	Manufacture of jewellery and related activities
Design: product, graphic and fashion design	74.10	Specialised design activities
Film, TV, video, radio and photography	59.11	Motion picture, video and television programme activities
	59.12	Motion picture, video and television post-production
	59.13	Motion picture, video and television programme distribution
	59.14	Motion picture projection activities
	60.10	Radio broadcasting
	60.20	Television programming and broadcasting activities
	74.20	Photographic activities
IT, software and computer services	58.21	Publishing of computer games
	58.29	Other software publishing
	62.01	Computer programming activities
	62.02	Computer consultancy activities
Publishing	58.11	Book publishing
	58.12	Publishing of directories and mailing lists
	58.13	Publishing of newspapers
	58.14	Publishing of journals and periodicals
	58.19	Other publishing activities
	74.30	Translation and interpretation activities
Museums, galleries and libraries	91.01	Library and archive activities
	91.02	Museum activities
Music, performing and visual arts	59.20	Sound recording and music publishing activities
	85.52	Cultural education
	90.01	Performing arts
	90.02	Support activities to performing arts
	90.03	Artistic creation
	90.04	Operations of arts facilities

An alternative and narrower version of this definition can be found in Nesta's 2009 paper on the Geography of Creativity in the United Kingdom. This definition was based on the DCMS definition but included only specific creative industries that are particularly likely to cluster together. A full breakdown of the sub-sectors and corresponding sic codes can be seen below:

Sub-sector	SIC	Description
Film, TV, video, radio and photography	59.11	Motion picture, video and television programme activities
	59.12	Motion picture, video and television post-production
	59.13	Motion picture, video and television programme distribution
	59.14	Motion picture projection activities
	60.10	Radio broadcasting
	60.20	Television programming and broadcasting activities
	74.20	Photographic activities
Publishing	58.11	Book publishing
	58.12	Publishing of directories and mailing lists
	58.13	Publishing of newspapers
	58.14	Publishing of journals and periodicals
	58.19	Other publishing activities
	74.30	Translation and interpretation activities
Music, performing and visual arts	59.20	Sound recording and music publishing activities
	85.52	Cultural education
	90.01	Performing arts
	90.02	Support activities to performing arts
	90.03	Artistic creation
	90.04	Operations of arts facilities

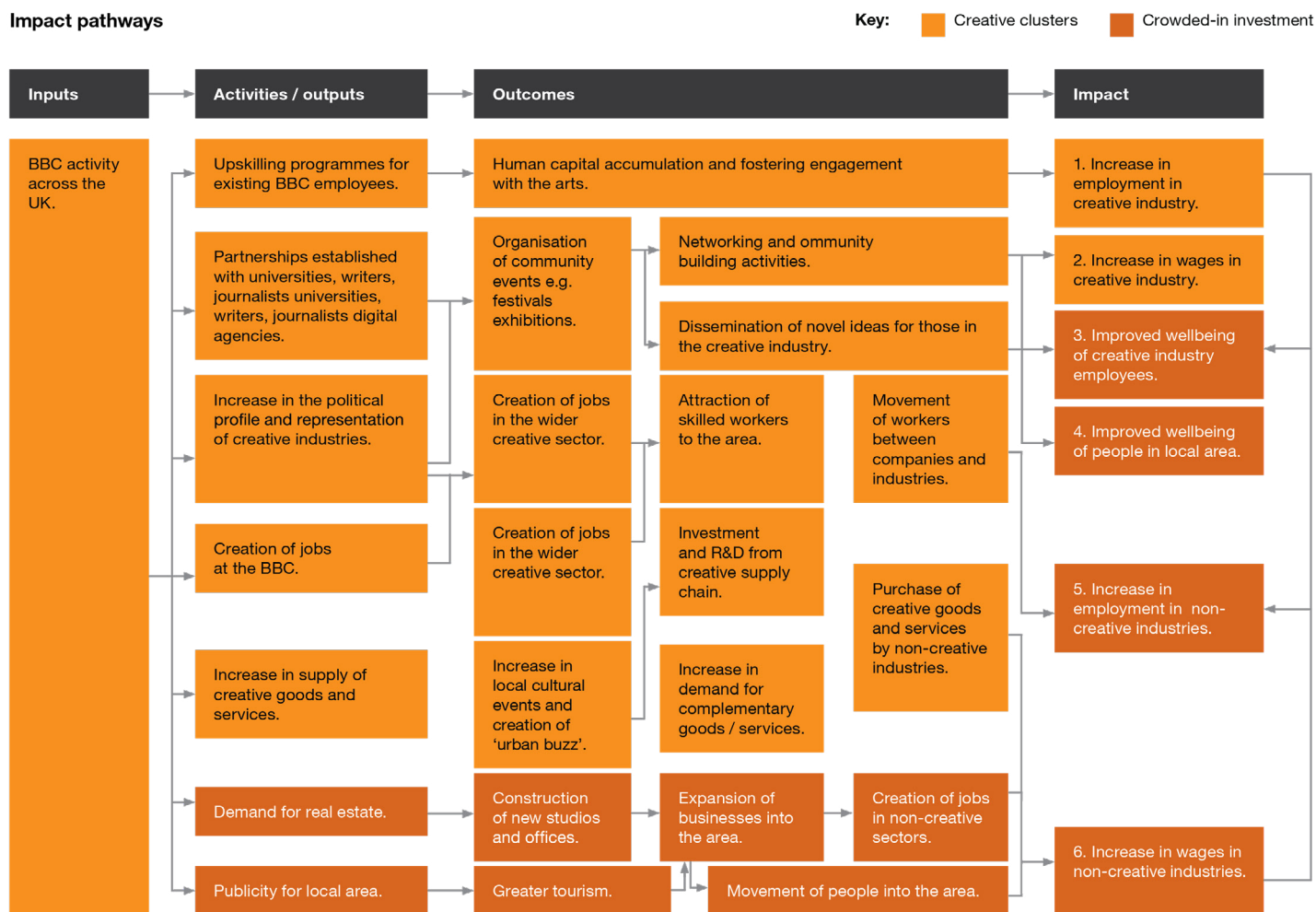
In our study we focus mainly on the DCMS definition as it is broader, more widely-used and more appropriate when looking at whole urban areas.

A.1 Theory of change and impact pathways

The economic and social indicators analysed in this study were identified by a rapid evidence assessment (REA), which also allows identifying using evidence from previous literature how impacts from BBC's activity and clustering come to happen. Based on such evidence, we build a theory of change that depicts the mechanisms of transmission from inputs (i.e. BBC's activities), to outcomes (e.g. increase crowd-in investments) to impacts (e.g. effect on local employment).

Figure 11 – Impact pathways for BBC activity

Source: PwC analysis



In terms of the final (economic) impacts, the REA provided evidence that the presence of creative clusters can improve employment, wages and wellbeing in creative and non-creative industries as well as in local areas. Garcia et al (2018) observed that creative clusters support employment growth across the UK because of the high growth rate of this sector¹¹⁵. This is supported by quantitative evidence from Innocenti et al (2019), they found that the greater the concentration of clustering, the greater the employment growth. Chapain et al (2010) pose a possible explanation for¹¹⁶ this; a high concentration of clustering increases the visibility of firms and can help creative workers find local employment¹¹⁷ thus increasing employment in the creative industry.

The concentration of clusters affects wages too, as Bakhshi et al (2014) discovered. They quantitatively analysed the relationship between creative clusters and wages in English cities. They found evidence that creative industry employees in cities with high levels of creative clustering receive a wage premium. This wage premium is the result of higher productivity, Bakhshi et al explain that this is associated with the strength of local creative clustering. So, it follows that, an increase in clustering would further increase this wage premium¹¹⁸.

Clustering not only affects creative industry employees but also those in non-creative sectors and adjacent areas. Virani et al (2018) explored the relationship between social inclusion and active creative cities. Their quantitative research included a 76-question survey (derived from qualitative research) of social inclusion practices of 112 people living in the local area. Over 60% of respondents felt that creative business in their local area helped with well-being and health¹¹⁹. Although survey responses are subjective and these figures may not be accurate, Tom Fleming Creative (TFC) Consultancy's research supports these findings. They investigated the effect of public investment on creative industries through the analysis of case studies and literature. They found that greater access to culture and art can improve happiness and general health (among other determinants)¹²⁰. These improvements in wellbeing are considered spill-over effects from the betterment of mental health caused by increased interaction with the arts. As both of these studies are based on qualitative research, there are limitations to their findings, these results may not be causal.

TFC Consultancy discovered 17 spill-over effects of public investment on creative industries, 5 of which are related to industry spill-overs, including improved business culture. Chapain et al (2010) conducted research that was consistent with this finding. They explored the role that creative industries play in local and regional development and found that creative clustering benefits non-creative industries through a 'creative push'. This 'push' stems from a creative 'nudging of innovation' where creative business models are spread to businesses in other sectors to increase their innovation and productivity¹²¹. This can lead to higher growth in non-creative sectors and eventually wages. Chapain et al (2010) also explain that greater creative industry presence can improve employment in non-creative industries. Cities labelled as 'creative' attract knowledge workers who may then be employed by other, non-creative, local businesses¹²². These knowledge workers strengthen the local talent pool and may attract more private investment.

Based on this literature, we build a series of bespoke models to capture the wider impacts and spill-over effects of BBC's activity on creative clustering and subsequently on: employment, wages, working conditions and apprenticeships and also social impacts like mental health, physical health and subjective wellbeing. The range of social impacts considered in this study was also determined by the availability of data.

¹¹⁵ Source: Garcia et al, How the creative industries are powering the UK's nations and regions, 2018.

¹¹⁶ Source: Innocenti et al, Do the creative industries support growth and innovation in the wider economy? Industry relatedness and employment growth in Italy, 2019.

¹¹⁷ Source: Chapain et al, Creative clusters and innovation, 2010.

¹¹⁸ Source: Bakhshi et al, Capital of culture? An econometric analysis of the relationship between arts and cultural clusters, wages and the creative economy in English cities, 2013. Note, however, that this research did not take individual characteristics into account like 'creativity' which can also affect wages so these results may be biased.

¹¹⁹ Source: Virani et al, Creative Clusters, Social Inclusion, and Sustainability: The Case of Hackney Wick and Fish Island, 2018.

¹²⁰ Tom Fleming Creative Consultancy, Cultural and Creative Spill-overs in Europe, 2015.

¹²¹ Chapain et al, Creative Clusters and Innovation, 2010.

¹²² Chapain et al, Creative Clusters and Innovation, 2010

A.3 Econometric approach

First stage approach

Equation (1) is estimated in first differences using ordinary least squares. *Cluster* is defined as the share of creative firms in TTWA *r* in year *t*. *employment spend* is the total employment spend within the spatial unit. *Creative procurement spend and non-creative procurement spend* are the total creative and non-creative BBC spend within the spatial unit. A full set of Year dummies are included to net out seasonality, to account for unobserved temporal (likely macroeconomic) shocks that affect the outcome variable. TTWA fixed effects are included to capture time-invariant local market characteristics that may be unobserved.

ϵ is an idiosyncratic error term, with assumed zero conditional mean.

$$\begin{aligned} \Delta \ln(\text{cluster})_{rt} = & \alpha + \beta \Delta \ln(\text{HR Spend})_{rt} \\ & + \gamma_1 \Delta \ln(\text{Non - Creative Procurement Spend})_{rt} \\ & + \gamma_2 \Delta \ln(\text{Creative Procurement Spend})_{rt} + \text{Year}_t \delta + \text{TTWA}_r \rho + \epsilon_{rt} \end{aligned}$$

We exploit the panel structure of the data to estimate a model in first differences with fixed effects, as there exists the potential for factors to impact the outcome variable that are not observed in the procurement nor employment data. As this area of research is novel, a suitable literature does not exist from which to extract a full set of explanatory covariates.

The model is estimated in logs as (a) this maximised model fit, and (b) the logical relationship is one of proportional changes given the varying sizes of TTWAs.

It is important to note that there is a theoretical upward bias in the procurement estimates due to reverse causality (i.e. the BBC may simply spend proportionally more of its creative/non-creative budget in areas that have proportionately higher levels of creative/non-creative industry); we do not seek to correct for this in specifications as: (i) results are small and broadly not significant even in the presence of the theoretical upward bias, adding credence to our conclusion that there is no causal relationship, and (ii) the statistical methods for correcting such a bias would rely on instrumental variables, which themselves are only asymptotically unbiased and the number of non-zero spatial units would likely be insufficient.

First stage results

Full regression results using DCMS definition

% Change in Creative Clustering	Outside of London		Including London	
	First difference and fixed effects	First difference	First difference and fixed effects	First difference
% Change Employment spend	0.0448**	0.0290**	0.0452**	0.0295**
% Change Creative Procurement spend	0.0059	0.0062	0.0060	0.0064
% Change Non-creative procurement spend	-0.0093*	-0.0083*	-0.0091*	-0.0080*
Spatial Units	252	252	260	260
R ²	0.91	0.91	0.91	0.91

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

Full regression results using Nesta definition

% Change in Creative Clustering	Outside of London		Including London	
	First difference and fixed effects	First difference	First difference and fixed effects	First difference
% Change Employment spend	0.0687**	0.0529**	0.0693**	0.0540**
% Change Creative Procurement spend	0.0078	0.0099	0.0079	0.0100
% Change Non-creative procurement spend	-0.0109	-0.0010	-0.0010	-0.0100
Spatial Units	252	252	260	260
R ²	0.70	0.70	0.70	0.70

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

Second stage approach

We conduct a multitude of spatial and microeconomic analyses into the relationship between creative clustering and wider spill-over effects. We combine Companies House microdata with the APS and Usoc, generating a panel dataset with observations aggregated by year and TTWA. A spatial unit is therefore defined as a TTWA in a given year.

TTWAs continue to be used as the spatial unit, to (a) ensure consistency with our first stage methodology set out in section 2.2, and (b) to ensure a sufficient number of observations within a spatial unit that there are a reasonable number of creative employees observed within each unit.

As set out in section X we use SIC codes in Companies House data, cross-referencing to our creative industries definitions, to calculate the proportion of creative companies within each spatial unit. This was previously our dependent variable in the first stage of our analysis and is now our key independent variable used in our spill-over analysis. This ensures consistency between our two stages of analysis and allows us to link BBC spending to the wider spill-over benefits through the medium of creative clustering.

As set out in section 3.1 we conducted a rapid evidence assessment (REA) to collate potential spill-over impacts from an increase in creative clustering. As the literature was largely qualitative, we narrowed the impacts down to those which we assessed to be quantifiable.

These outcomes are:

- Employment.
 - Employment in creative industries.
 - Employment in non-creative industries.
 - Overall employment rate.
- Level of earnings (wages).
 - From working in creative industries.
 - From an increase in creative clustering on creative industry employees.
 - From an increase in creative clustering on people in the local area.
- Working conditions, proxied by unpaid overtime.
 - For those employed in creative industries
 - From a increase in creative clustering on all employees.
- Mental health.
 - From working in creative industries.
 - From an increase in creative clustering on creative industry employees.
 - From an increase in creative clustering on people in the local area.
- Physical health.
 - From working in creative industries.
 - From an increase in creative clustering on creative industry employees.
 - From an increase in creative clustering on people in the local area.
- Life satisfaction.
 - From working in creative industries.
 - From an increase in creative clustering on creative industry employees.
 - From an increase in creative clustering on people in the local area.

For each outcome we built an econometric model, including time and region fixed effects and estimated the marginal impact from a one percent increase in creative clustering on our outcome variable, or the marginal impact from being employed in creative industries on a given individual. We did this both including and excluding London, finding no significant difference in our coefficients, and for both the Nesta and DCMS definition of creative industries.

The model is estimated in logs as (a) this maximised model fit, and (b) the logical relationship is one of proportional changes given the varying sizes of TTWAs.

Data

We utilise micro level individual data from the Annual Population Survey (APS) and Understanding Society (Usoc) from 2011-2021 to evaluate the wider impacts and spill-over effects of creative clustering. This allowed us to leverage individual micro-level data, identifying the effects on individuals.

The APS is a cross-sectional survey derived from the quarterly Labour Force Survey, a rolling panel survey of approximately 12,000 households, following respondents for five consecutive quarters (Waves 1-5). The APS is comprised of Wave 1 and 5 LFS data for four consecutive quarters, achieving a representative sample of approximately 80,000 households. The APS additionally includes data from three annual boost samples, achieving a total sample size of around 120,000 households.

Broadly, the APS allowed us to measure a range of economic variables:

- Employment, utilising the industry of main job and cross-referencing with SIC codes to determine whether it is creative (for both DCMS and Nesta).
- Wages, using hourly pay data.
- Working conditions, using the number of hours of unpaid overtime worked.
- Apprenticeships, using the completed apprenticeship variable.

USoc surveys approximately 40,000 households per wave, interviewing around 100,000 individual respondents. Life Satisfaction is measured on a 1-7 scale ranging from completely dissatisfied to completely satisfied. Physical and Mental health are measured using the SF-12 Health Survey: these are derived variables based on a number of standardised health-related questions, measured on a 0-100 scale. We utilise the pooled cross-sectional data across all years for our primary analysis to maximise the available sample.

Similarly, Usoc data was used to measure social impacts:

- Mental health, using the short form 12 (SF-12) measure. This is regarded by the World Health Organisation (WHO) as an objective measure of an individual's mental health.
- Physical health, using the short form 12 (SF-12) measure. This is regarded by the World Health Organisation (WHO) as an objective measure of an individual's physical health.
- Life satisfaction, which is based off an individual's self reported score.



Effect on employment

We used micro level individual data from the APS to measure the effect of an increase in creative clustering on employment both locally and within creative industries. There does exist a variable (OYICD07) that details the sector in which an individual was employed twelve months ago, however the ONS has stopped releasing this variable for analysis (even at the ministerial level); we therefore aggregated employment (INDSC07M) at the TWA level by year and analysed spatial changes in employment composition over time.

Our final specification built on work by Garcia, Klinger and Stathoulopoulos (2018)¹²³ and used OLS regression analysis with regional fixed effects to account for unobserved time-invariant regional characteristics, and a full set of time dummies to detrend the data, accounting for macroeconomic shocks. Our results therefore show the effect of an increase in creative clustering on the local employment rate. This analysis was replicated for both creative industry employees (equation 1) and people in the local area (equation 3); we also ran the regressions using both the DCMS and Nesta definitions of creative industries, providing an extra layer of robustness and nuance to our analysis. For both DCMS and Nesta, the equations are identical and X is a $(N \times k)$ matrix of covariates constructed in line with current best-practice in the literature.

$$\ln(\text{employment rate in CI})_{rt} = \alpha + \beta \ln(\text{proportion of firms in CI})_{rt} + X\beta + \text{Year}_t\delta + \epsilon_{rt} \quad (1)$$

$$\ln(\text{employment rate in nonCI})_{rt} = \alpha + \beta \ln(\text{proportion of firms in CI})_{rt} + X\beta + \text{Year}_t\delta + \epsilon_{rt} \quad (2)$$

$$\ln(\text{total employment rate})_{rt} = \alpha + \beta \ln(\text{proportion of firms in CI})_{rt} + X\beta + \text{Year}_t\delta + \epsilon_{rt} \quad (3)$$

Effect on wages

We used micro level individual data from the APS to measure the effect of an increase in creative clustering on wages both locally (equation 5) and within creative industries (equation 4). We also measured the effect of being employed in creative industries, on a given individual by utilising a creative industry dummy variable and controlling for individual characteristics (equation 6). To do this we utilised the 'HOURPAY' variable as our dependent variable which details an individual's hourly pay.

Our final specification was a Mincer earnings equation and built on Card's (1999) paper on the effect of education on earnings and used OLS regression analysis. We again used regional fixed effects to account for unobserved time-invariant regional characteristics, and a full set of time dummies to detrend the data, accounting for macroeconomic shocks. Our results therefore show the effect of an increase in creative clustering on wages of both creative industry employees and locals. The dummy variable specification shows the impact of being employed in creative industries for a given individual. We also ran the regressions using both the DCMS and Nesta definitions of creative industries, providing an extra layer of robustness and nuance to our analysis. For both DCMS and Nesta, the equations are identical and X is a $(N \times k)$ matrix of covariates constructed in line with current best-practice in the literature.

$$\ln(\text{hourly pay for CI employees})_{rt} = \alpha + \beta \ln(\text{proportion of firms in CI})_{rt} + X\beta + \text{Year}_t\delta + \text{TWA}_{t,p} + \epsilon_{rt} \quad (4)$$

$$\ln(\text{hourly pay for all})_{rt} = \alpha + \beta \ln(\text{proportion of firms in CI})_{rt} + X\beta + \text{Year}_t\delta + \text{TWA}_{t,p} + \epsilon_{rt} \quad (5)$$

$$\ln(\text{hourly pay})_{rt} = \alpha + \beta (\text{Work in CI})_{rt} + X\beta + \text{Year}_t\delta + \text{TWA}_{t,p} + \epsilon_{rt} \quad (6)$$



¹²³ Garcia, J et al, How the creative industries are powering the UK's nations and regions, 2018.

Effect on apprenticeships

We used micro level individual data from the APS to measure the effect of an increase in creative clustering on the level of apprenticeship completion in a TTWA. We also measured the effect of being employed in creative industries on a given individual, by utilising a creative industry dummy variable and controlling for individual characteristics. To do this we utilised the ‘APPR12’ variable as our dependent variable which is a binary variable on whether an individual has completed an apprenticeship.

Our final specification was a Probit model with the outcome variable being whether an individual has completed an apprenticeship (equation 7). We leveraged Greig’s (2020)¹²⁴ paper on factors affecting apprenticeship completion in Scotland so we could include a full list of relevant covariates. We also used a paper by Stromback and Mahendram¹²⁵ which analysed the factors contributing to apprenticeship and traineeship completion in Australia to build our Probit model. We again used regional fixed effects to account for unobserved time-invariant regional characteristics, and a full set of time dummies to detrend the data, accounting for macroeconomic shocks. Our results therefore show the effect of an increase in creative clustering on the probability that an individual in the area completes an apprenticeship. The dummy variable specification shows the impact of being employed in creative industries on the probability a given individual in a TTWA completes an apprenticeship. We also ran the regressions using both the DCMS and Nesta definitions of creative industries, providing an extra layer of robustness and nuance to our analysis. For both DCMS and Nesta, the equations are identical and X is a $(N \times k)$ matrix of covariates constructed in line with current best-practice in the literature.

$$\text{probability of apprenticeship completion}_{it} = \alpha + \beta(\text{proportion of firms in CI})_{it} + X\beta + \text{Year}_t\delta + \text{TTWA}_t\rho + \varepsilon_{it} \quad (7)$$

Effect on working conditions

We used micro level individual data from the APS to measure the effect of an increase in creative clustering on working conditions locally (equation 8) and the effect of working in creative industries on working conditions (equation 9). The literature review suggested several possible metrics to indicate working conditions: union membership, wages, annual holiday allowance and unpaid overtime. As wages had already been analysed as its own impact pathway we decided to scope this out to avoid duplication. Furthermore, both the union membership variable (UNION) and the annual paid holiday allowance variable (HOLS) were missing from the dataset (this was confirmed to us by the head of research at the ONS). We therefore used hours of unpaid overtime (ACTUOT) as a proxy for working conditions.

Our final specification was built on work by Barone and Mocetti (2010)¹²⁶ which explored the effect of immigration on working supply and used OLS regression analysis. We again used regional fixed effects to account for unobserved time-invariant regional characteristics, and a full set of time dummies to detrend the data, accounting for macroeconomic shocks. Our results therefore show the effect of an increase in creative clustering on working conditions of all people in the local area. The dummy variable specification shows the effect on working conditions of being employed in creative industries for a given individual. We also ran the regressions using both the DCMS and Nesta definitions of creative industries, providing an extra layer of robustness and nuance to our analysis. For both DCMS and Nesta, the equations are identical and X is a $(N \times k)$ matrix of covariates constructed in line with current best-practice in the literature.

$$\ln(\text{unpaid overtime})_{it} = \alpha + \beta \ln(\text{proportion of CI})_{it} + X\beta + \text{Year}_t\delta + \text{TTWA}_t\rho + \varepsilon_{it} \quad (8)$$

$$\ln(\text{unpaid overtime})_{it} = \alpha + \beta(\text{work in CI})_{it} + X\beta + \text{Year}_t\delta + \text{TTWA}_t\rho + \varepsilon_{it} \quad (9)$$

¹²⁴ Greig, M, Factors affecting apprenticeship completion in Scotland, 2020.

¹²⁵ Mahendram, A and Stromback, T, An analysis of factors contributing to apprenticeship and traineeship completion, 2010.

¹²⁶ Barone, G and Mocetti, The effect of low-skilled Immigration on the female labour supply, 2010.

Effect on subjective wellbeing

We used micro level individual data from Usoc to measure the effect of an increase in creative clustering on subjective wellbeing i.e. life satisfaction of individuals both locally and in creative industries. We also utilised a creative industry dummy variable to analyse the effect of being employed in creative industries on an individual's subjective wellbeing. The variable of interest was 'scghq1_dv' and was used as our dependent variable.

The academic literature that shaped our analysis was given by Fujiwara (2013)¹²⁷ who used the 'British Household Panel Study', now known as Understanding Society and built a three-stage wellbeing valuation model. Our analysis follows a similar yet more simplistic approach as we use OLS regression with regional fixed effects to account for unobserved time-invariant regional characteristics, and a full set of time dummies to detrend the data, accounting for macroeconomic shocks. The model shows the effect of creative clustering on an individual's life satisfaction for both local individuals (equation 11) and creative industry employees (equation 10) in a given TTWA. The dummy variable specification (equation 12) shows us the impact of being employed in creative industries on the subjective wellbeing of a given individual, as we control for individual characteristics. We also ran the regressions using both the DCMS and Nesta definitions of creative industries, providing an extra layer of robustness and nuance to our analysis. For both DCMS and Nesta, the equations are identical and X is a $(N \times k)$ matrix of covariates constructed in line with current best-practice in the literature.

$$\begin{aligned} \text{life satisfaction for CI employees}_{it} &= \beta \ln(\text{proportion of firms in CI}_{it}) + X\beta + \text{Year}_t\delta + \text{TTWA}_{it}\rho + \epsilon_{it} & (10) \\ \text{life satisfaction for all}_{it} &= \beta \ln(\text{proportion of firms in CI}_{it}) + X\beta + \text{Year}_t\delta + \text{TTWA}_{it}\rho + \epsilon_{it} & (11) \\ \text{life satisfaction}_{it} &= \beta \ln(\text{work in CI}_{it}) + X\beta + \text{Year}_t\delta + \text{TTWA}_{it}\rho + \epsilon_{it} & (12) \end{aligned}$$

Effect on mental health

We used micro level individual data from Usoc to measure the effect of an increase in creative clustering on mental health of individuals both locally (equation 14) and in creative industries (equation 13). We also utilised a creative industry dummy variable (equation 15) to analyse the effect of being employed in creative industries on an individual's mental health. The variable of interest was 'sfmcs_dv' and was used as our dependent variable.

The academic literature that shaped our analysis was given by Christopher Boyce et al (2014)¹²⁸ who used the 'British Household Panel Study', now known as Understanding Society, to estimate whether income losses had a greater effect on wellbeing than gains. The paper utilised the variable General Health Questionnaire 12, which our variable of interest, Short Form 12 is a variant of. We used OLS regression with regional fixed effects to account for unobserved time-invariant regional characteristics, and a full set of time dummies to detrend the data, accounting for macroeconomic shocks.

The model shows the effect of creative clustering on an individual's mental health for both local individuals and creative industry employees in a given TTWA. The dummy variable specification shows us the impact of being employed in creative industries on the mental health of a given individual, as we control for individual characteristics. We also ran the regressions using both the DCMS and Nesta definitions of creative industries, providing an extra layer of robustness and nuance to our analysis. For both DCMS and Nesta, the equations are identical and X is a $(N \times k)$ matrix of covariates constructed in line with current best-practice in the literature.

$$\begin{aligned} \ln(\text{mental health for CI employees})_{it} &= \alpha + \beta \ln(\text{proportion of firms in CI}_{it}) + X\beta + \text{Year}_t\delta + \text{TTWA}_{it}\rho + \epsilon_{it} & (13) \\ \ln(\text{mental health for all})_{it} &= \beta \ln(\text{proportion of firms in CI}_{it}) + X\beta + \text{Year}_t\delta + \text{TTWA}_{it}\rho + \epsilon_{it} & (14) \\ \ln(\text{mental health})_{it} &= \beta (\text{Work in CI}_{it}) + X\beta + \text{Year}_t\delta + \text{TTWA}_{it}\rho + \epsilon_{it} & (15) \end{aligned}$$

Effect on physical health

We used micro level individual data from Usoc to measure the effect of an increase in creative clustering on physical health of individuals both locally (equation 17) and in creative industries (equation 16). We also utilised a creative industry dummy variable (equation 18) to analyse the effect of being employed in creative industries on an individual's mental health. The variable of interest was 'sfpcs_dv' and was used as our dependent variable.

The academic literature that shaped our analysis was again given by Christopher Boyce et al (2014) who used the 'British Household Panel Study', now known as Understanding Society, to estimate whether income losses had a greater effect on wellbeing than gains. The paper utilised the variable General Health Questionnaire 12, which our variable of interest, Short Form 12 is a variant of. We use OLS regression with regional fixed effects to account for unobserved time-invariant regional characteristics, and a full set of time dummies to detrend the data, accounting for macroeconomic shocks. The model shows the effect of creative clustering on an individual's physical health for both local individuals and creative industry employees in a given TTWA. The dummy variable specification shows us the impact of being employed in creative industries on the physical health of a given individual, as we control for individual characteristics. We also ran the regressions using both the DCMS and Nesta definitions of creative industries, providing an extra layer of robustness and nuance to our analysis. For both DCMS and Nesta, the equations are identical and X is a $(N \times k)$ matrix of covariates constructed in line with current best-practice in the literature.

$$\begin{aligned} \ln(\text{physical health for CI employees})_{it} &= \beta \ln(\text{proportion of firms in CI}_{it}) + X\beta + \text{Year}_t\delta + \text{TTWA}_{it}\rho + \epsilon_{it} & (16) \\ \ln(\text{physical health for all})_{it} &= \beta \ln(\text{proportion of firms in CI}_{it}) + X\beta + \text{Year}_t\delta + \text{TTWA}_{it}\rho + \epsilon_{it} & (17) \\ \ln(\text{physical health})_{it} &= \beta (\text{Work in CI}_{it}) + X\beta + \text{Year}_t\delta + \text{TTWA}_{it}\rho + \epsilon_{it} & (18) \end{aligned}$$

¹²⁷ Fujiwara, D, A General Method for Valuing Non-market Good Using Wellbeing Data: Three-stage Wellbeing Valuation, 2013.

¹²⁸ Boyce, C et al, Money, well-being and loss aversion: Does an Income loss have a greater effect on wellbeing than an equivalent income gain?, 2014

Second stage results

% Change in employment	Outside of London								Including London							
	DCMS				Nesta				DCMS				Nesta			
Region fixed effects	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗
Time fixed effects	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗
% Change from a 1 p.p increase in creative clustering (CI employees)	1.7**	-0.6**	1.7**	1.6**	0.4**	0.2**	0.4**	0.5**	1.7**	1.5**	1.7**	1.5**	0.9**	0.2**	0.4**	0.2**
% Change from a 1 p.p increase in creative clustering (non-CI employees)	-1.2**	-0.8**	-1.2**	-0.8**	-0.1	0.6**	0.0	0.6**	-1.2**	0.7**	-1.2**	-0.7**	-0.6**	0.6**	0.0	0.7**
% Change from a 1 p.p increase in creative clustering (All employees)	0.5**	0.8**	0.5**	0.8**	0.3**	0.9**	0.3**	0.9**	0.5**	0.8**	0.5**	0.8**	0.3**	0.9**	0.3**	0.9**
Spatial units	1,736	1,736	1,736	1,736	1,733	1,733	1,733	1,733	1,744	1,744	1,744	1,744	1,741	1,741	1,741	1,741
R ²	0.19	0.07	0.19	0.07	0.10	0.07	0.10	0.09	0.20	0.08	0.20	0.09	0.25	0.09	0.12	0.09
	to 0.32	to 0.24	to 0.32	to 0.24	to 0.32	to 0.21	to 0.32	to 0.21	to 0.32	to 0.25	to 0.3	to 0.25	to 0.32	to 0.25	to 0.32	to 0.21

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in wages	Outside of London								Including London							
	DCMS				Nesta				DCMS				Nesta			
Region fixed effects	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗
Time fixed effects	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗
% Change from a 1 p.p increase in creative clustering (CI employees)	9.0**	9.3**		11.6*	6.1**	13.1**	8.8**	8.8**	9.4**	9.7**	12.7**	14.0**	7.3**	13.1**	13.1**	13.1*
% Change from a 1 p.p increase in creative clustering (non-CI employees)	-4.3	43.8*	33.4**	36.2**	-7.7	21.2**	28.9**	27.8**	-5.8	38.5**	42.3**	42.7**	10.5	23.8**	38.0**	35.0**
% Change from a 1 p.p increase in creative clustering (All employees)	-1.5	39.6**	17.1	22.1	-0.7	24.8**	9.3**	16.3**	0.0	38.8**	23.8**	27.6**	-0.6	26.6**	17.8**	21.1**
Spatial units	15,422	15,422	15,422	4,063		4,063	4,063	4,063	18,937	18,937	18,937		5,362	5,362	5,362	5,362
	to 551,912	to 551,912	to 551,912	to 551,760		to 551,760	to 551,760	to 551,760	to 597,226	to 597,226	to 597,226		to 597,074	to 597,074	to 597,074	to 597,074
R ²	0.34	0.31	0.30	0.34		0.30	0.31	0.30	0.34	0.33						
		to 0.34	to 0.32	to 0.40		to 0.40	to 0.32	to 0.31								

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

Change in probability of apprenticeship completion	Outside of London								Including London							
	DCMS				Nesta				DCMS				Nesta			
Region fixed effects	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗
Time fixed effects	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗
Change for CI employees																
Change from a 1 p.p increase in creative clustering (CI employees)	0.651				0.427				0.298				0.249			
Change from a 1 p.p increase in creative clustering (locals)	871,100								960,399							
Spatial Units	0.12								0.13							
R ²																

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in unpaid overtime	Outside of London								Including London							
	DCMS				Nesta				DCMS				Nesta			
Region fixed effects	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗
Time fixed effects	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗
% Change for CI employees	8.8**	-8.9**	-8.9**	-8.9**	-8.7**	-8.6**	-8.5**	-8.4**	-9.5**	-9.6**	-8.2**	-8.2**	-11.5	-11.5	-9.4**	-9.4**
% Change from a 1 p.p increase in creative clustering (CI employees)	-11.0*	11.8**	-4.2**	-5.4**	-3.4	-6.7**	-3.3**	4.8**	-13.9	-13.8	1.0	-1.7	-4.4	-8.1**	3.4**	0.0
Spatial units	111,458	111,458	111,458	111,458	111,458	111,458	111,458	111,458	125,456	125,458	125,458		125,458	125,458	125,458	125,458
R ²	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.01		0.02	0.02	0.01	0.01

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in mental health score	Outside of London								Including London							
	DCMS				Nesta				DCMS				Nesta			
Region fixed effects	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗
Time fixed effects	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗
% Change for CI employees	-1.2**	-1.2**	-1.4**	-1.3**		-1.3**	-1.3**	-1.9**	-1.8**	-2.0**	-1.9**	-2.0**	-2.0**	-2.6**	-2.5**	-2.5**
% Change from a 1 p.p increase in creative clustering (CI employees)	4.2	11.8**	-4.2**	-5.4**	-3.4	-6.7**	-3.3**	4.8**	-13.9	-13.8	1.0	-1.7	-4.4	-8.1**	3.4**	0.0
Spatial Units	5,045 to 225,585	5,045 to 225,585	5,045 to 225,585	5,051 to 225,679	1,476 to 225,570	1,476 to 225,570	5,050 to 225,664	5,050 to 225,664	6,280 to 254,238	6,280 to 254,238	6,285 to 254,332	6,285 to 4,332	1,999 to 25,223	1,999 to 225,223	1,970 to 225,317	1,970 to 225,317
R ²	0.05 to 0.11	0.04 to 0.10	0.04 to 0.10	0.03 to 0.07	0.07 to 0.22	0.04 to 0.23	0.04 to 0.23	0.03 to 0.07	0.04 to 0.12	0.04 to 0.11	0.04 to 0.06	0.03 to 0.06	0.05 to 0.18	0.04 to 0.06	0.04 to 0.07	0.03 to 0.06

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in Physical health score	Outside of London								Including London							
	DCMS				Nesta				DCMS				Nesta			
Region fixed effects	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗
Time fixed effects	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗
% Change for CI employees	1.7**	1.7	1.8**	1.8**	1.6**	1.6**	1.8**	1.8**	1.9**	1.9**	2.0**	2.0**	2.0**	2.0**	2.0**	2.0**
% Change from a 1 p.p increase in creative clustering (CI employees)	-1.9	0.8	2.7**	2.3**	6.9	3.2	-1.8	-0.4	-0.6	0.5	2.6**	2.0**	6.8	3.1	-0.5	0.1
% Change from a 1 p.p increase in creative clustering (locals)	0.2	0.5*	4.2**	3.1**	-1.7**	0.4	2.6**	2.1**	-0.1	0.4*	3.8**	2.8**	-1.7**	0.3	2.1**	1.8**
Spatial Units	5,046 to 225,995	5,046 to 225,995	5,051 to 25,679	5,051 to 25,679	1,476 to 225,580	1,476 to 225,580	1480 to 225,674	1480 to 225,674	6,321 to 254,250	6,321 to 254,250	6,286 to 254,344	6,286 to 254,344	1,966 to 254,235	1,966 to 254,235	1,970 to 254,329	1,970 to 254,329
R ²	0.06 to 0.19	0.06 to 0.19	0.06 to 0.08	0.06 to 0.18	0.06 to 0.23	0.06 to 0.23	0.06 to 0.18	0.06 to 0.19	0.07 to 0.19	0.07 to 0.19	0.06 to 0.19	0.06 to 0.19	0.06 to 0.19	0.06 to 0.19	0.06 to 0.19	0.06 to 0.19

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in Life satisfaction	Outside of London								Including London							
	DCMS				Nesta				DCMS				Nesta			
Region fixed effects	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓	✗	✗
Time fixed effects	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗	✓	✗
% Change for CI employees	-2.1	-2.4	-2.5	-2.8	0.9	0.3	11.2	0.5	0	-0.4	10	-1.4	1.0	0.2	0.0	-0.6
% Change from a 1 p.p increase in creative clustering (CI employees)	20.3	5.0	10.2	7.3	47.3	24.5	12.3	18.0	20.6	5.1	-1.0	7.4	7.8	37.1*	0.3	8.5
% Change from a 1 p.p increase in creative clustering (locals)	-12.3**	-7.3**	-4.3**	-5.0**	-4.4	18.8**	-0.6	6.5**	-9.2**	-5.7**	-7.4**	-6.5**	-3.7	20.2**	-5.1**	1.8**
Spatial Units	3,386 to 112,963	3,386 to 112,963	3,389 to 113,025	3,389 to 113,025	841 to 112,960	841 to 112,960	844 to 113,022	844 to 113,022	4,228 to 127,802	4,228 to 127,802	4,231 to 127,864	4,231 to 127,864	1,136 to 127,799	1,136 to 127,799	1,139 to 127,861	1,139 to 127,861
R ²	0.25 to 0.31	0.25 to 0.31	0.25 to 0.28	0.25 to 0.28	0.25 to 0.34	0.25 to 0.35	0.25 to 0.30	0.25 to 0.30	0.25 to 0.30	0.25 to 0.30	0.25 to 0.28	0.25 to 0.28	0.25 to 0.32	0.25 to 0.33	0.25 to 0.29	0.25 to 0.29

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

Result tables

% Change in employment rate in creative industries	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	1.7**	0.9**
Age	-0.6**	-0.1**
Age ²	0.0**	0.0**
Dependent children	0.4	0.2
Born in UK	-5.9**	-6.7**
Degree educated	12.2**	1.1**
White	0.0	1.3
Married or with partner	0.8	1.3
Female	-3.9*	2.1*
Spatial Units	1744	1741
R ²	0.2731	0.2494

% Change in employment rate in non-creative industries	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	-1.1**	-0.6**
Age	0.4*	0.4**
Age ²	0.0**	0.0**
Dependent children	0.2	0.3
Born in UK	2.4	2.9
Degree educated	-2.9	-4.9*
White	9.2**	9.2**
Married or with partner	14.3**	14.2**
Female	12.4**	12.3**
Spatial Units	1744	1741
R ²	0.2143	0.2025

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in total employment	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	0.5**	0.3**
Age	-0.2	-0.2
Age ²	0.0	0.0
Dependent children	0.6	0.6
Born in UK	-3.5**	-3.8**
Degree educated	9.2**	10.0**
White	9.3**	9.4**
Married or with partner	15.1**	15.1**
Female	8.4**	8.3**
Spatial Units	1744	1741
R ²	0.3213	0.3202

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in unpaid overtime	With region and time fixed effects, including London	
	DCMS	Nesta
Work in creative industries	-9.5**	-11.5**
Age	0.0**	0.0**
Born in UK	-4.5**	-4.5**
Degree educated	20.5**	20.3**
White	-3.0**	-3.2
Married or with partner	4.2**	4.3**
Spatial Units	125,458	125,458
R ²	0.0193	0.0191

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in unpaid overtime for all	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	-13.9**	-4.4
Age	0.0**	0.0**
Born in UK	-4.5**	-4.5**
Degree educated	20.1**	20.1**
White	-3.5**	-3.4**
Married or with partner	4.3**	4.3**
Spatial Units	125,682	125,659
R ²	0.0187	0.0187

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

Change in probability of apprenticeship completion	With region and time fixed effects, including London	
	DCMS	Nesta
Proportion of firms in CI	0.288	0.249
Female	-79.7	-79.7**
Age	-1.4**	-1.4**
Age ²	0.0**	0.0**
Dependent children	0.6	0.6
Born in UK	40.7**	40.7**
White	36.0**	36.0**
Married or with partner	3.3**	-3.3**
Spatial Units	960,399	960,399
R ²	0.1319	0.1319

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in hourly pay for creative industry employees	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	-5.8	10.5
Age	8.2**	8.2**
Age ²	-0.0**	-0.0**
Born in UK	2.9**	1.9
Degree Educated	20.8**	20.5**
White	8.0**	4.7*
Female	-16.1**	-7.6**
Married or with partner	7.9**	6.5**
Spatial Units	18,937	5,362
R ²	0.3307	0.3895

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in hourly pay	With region and time fixed effects, including London	
	DCMS	Nesta
Work in creative industries	9.0**	7.3**
Age	5.6**	5.6**
Age ²	-0.0**	-0.0**
Born in UK	10.7**	10.8**
Degree Educated	39.3**	39.56**
White	10.5**	10.7**
Female	-17.9**	-18.0**
Married or with partner	9.1**	9.1**
Spatial Units	596,414	596,414
R ²	0.3462	0.3452

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in hourly pay for all	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	-0.0	-0.6
Age	5.6**	5.6**
Age ²	-0.0**	-0.0**
Born in UK	10.8**	10.8**
Degree Educated	39.6**	39.6**
White	10.7**	10.7**
Female	-18.0**	-19.0**
Married or with partner	9.1**	9.1**
Spatial Units	597,226	597,074
R ²	0.3450	0.3450

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in mental health for CI employees	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	3.9	-9.9
Leq household income	3.0**	3.6**
Retired	4.8*	5.9**
Higher educated	1.3*	-3.2**
Age	-0.2*	-0.6**
Age ²	0.0**	0.0**
Married	4.3**	4.4**
Unemployed	-8.6	-1.3
Divorced	-1.3	-3.4
Widowed	4.0	4.0
Homeowner	2.7**	5.0**
Has kids	0.6	-2.0
Spatial Units	6,280	1,966
R ²	0.099	0.1844

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in mental health	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	-2.0**	-2.6**
Leq household income	1.8**	1.7**
Retired	1.2*	1.2*
Higher educated	-1.0**	-1.0**
Age	-0.4**	-0.4**
Age2	0.0**	0.0**
Married	3.3**	3.3**
Unemployed	-7.9**	-7.9**
Divorced	-1.2**	-1.2**
Widowed	-0.4	-0.4
Homeowner	1.8**	1.8**
Has kids	0.4**	0.4**
Spatial Units	144,793	144,793
R ²	0.0446	0.0445

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in mental health for all	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	1.6**	0.7
Leq household income	1.8**	1.8**
Retired	2.7**	2.7**
Higher educated	0.8**	0.8**
Age	-0.2**	-0.2**
Age2	0.0**	0.0**
Married	3.8**	3.8**
Unemployed	-7.7**	-7.7**
Divorced	-1.7**	-1.7**
Widowed	-1.1**	-1.1**
Homeowner	5.8**	5.8**
Has kids	0.3**	0.3**
Spatial Units	254,238	254,223
R ²	0.0674	0.0673

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in physical health for CI employees	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	-0.6	6.8
Leq household income	1.0**	1.6**
Retired	4.9**	6.5**
Higher educated	4.2**	5.4**
Age	0.2**	0.2
Age2	0.0**	-0.0**
Married	-0.1	-0.7
Unemployed	-11.7**	-22.8**
Divorced	-2.2*	-1.6
Widowed	4.3	8.9*
Homeowner	3.3**	1.3
Has kids	-0.3**	0.0
Spatial Units	6,281	1,966
R ²	0.145	0.1882

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in physical health	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	2.0**	2.0**
Leq household income	2.2**	2.2**
Retired	-0.4	-0.3
Higher educated	2.4**	2.4**
Age	-0.2**	-0.2**
Age2	-0.0**	-0.0**
Married	-0.6**	-0.6**
Unemployed	-0.4	-0.4
Divorced	-1.9**	-1.9**
Widowed	-1.4**	-1.4**
Homeowner	3.0**	3.0**
Has kids	1.1**	1.1**
Spatial Units	144,796	144,796
R ²	0.0649	0.0646

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

% Change in physical health for all	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	1.6**	0.7
Leq household income	1.9**	1.9**
Retired	-1.3**	-1.3**
Higher educated	4.8**	4.8**
Age	-0.1*	-0.1**
Age2	-0.0**	-0.0**
Married	0.6**	0.6**
Unemployed	-1.9**	-1.9**
Divorced	-4.0**	-4.0**
Widowed	-4.6**	-4.6**
Homeowner	9.5*	9.5**
Has kids	0.5**	0.5**
Spatial Units	254,250	254,235
R ²	0.192	0.1921

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

Change in life satisfaction for CI employees	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	0.2	0.8
Physical Health	0.0**	0.3**
Mental Health	0.1**	0.1**
Age	-0.0**	-0.4**
Age2	0.0*	0.0
Carer	-0.2*	0.1
Leq household income	0.2**	0.3**
Unemployment	0.0	1.2*
Retired	0.2	0.3
Married	0.3**	0.3**
Female	0.1**	-0.2*
Spatial Units	4,228	1,136
R ²	0.2027	0.3221

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

Change in life satisfaction for all	With region and time fixed effects, including London	
	DCMS	Nesta
Natural logarithm of proportion of firms in CI	-0.1**	-0.0
Physical Health	0.0**	0.0**
Mental Health	0.0**	0.1**
Age	-0.0**	-0.4**
Age2	0.0**	0.0**
Carer	-0.1**	-0.1**
Leq household income	0.2**	0.2**
Unemployment	-0.1	-0.1
Retired	0.2**	0.2**
Married	0.3**	0.3**
Female	0.1**	0.1**
Spatial Units	127,802	127,799
R ²	0.2521	0.2521

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

Change in life satisfaction	With region and time fixed effects, including London	
	DCMS	Nesta
Work in Creative Industries	-0.0	0.0
Physical Health	0.0**	0.0*
Mental Health	0.1**	0.1**
Age	-0.0**	-0.0**
Age2	0.0**	0.0**
Carer	-0.1**	-0.1**
Leq household income	0.2**	0.2**
Unemployment	-0.1	-0.1
Retired	0.2**	0.2**
Married	0.2**	0.3**
Female	0.1**	0.1**
Spatial Units	125,257	125,257
R ²	0.252	0.252

Robust t-statistics in parentheses. * p<0.1, ** p<0.05

Likelihood of having completed an apprenticeship	With region and time fixed effects, including London	
	DCMS	Nesta
Employed in creative industries (binary)	-0.49**	-0.53**
Female	-0.78**	-0.78**
Age	-0.032**	-0.32**
Age ²	0.0005	0.0005
Dependent children	0.0034	0.004
UK born	0.43**	0.43**
Ethnic White	0.35**	0.35**
Married	-0.05*	-0.049*

* p<0.1, ** p<0.05

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Thank you

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